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ABSTRACT

The longer-term employment and training outcomes of enrollment in vocational education and training (VET) were examined. The study analyzed data from the 1993 "Survey of Training and Education Experience" (STE) and the 1997 "Survey of Education and Training Experience" (SET) which were conducted by the Australian Bureau of Statistics to collect data on individuals from the same cohorts at two different points in time. Completing VET qualifications improved graduates' full-time employment outcomes. Male VET graduates appeared to enjoy more substantial immediate benefits from completion of their qualifications than did female graduates, with differences in the impact of completion of a skilled vocational qualification lying at the heart of the divergence in outcomes. The actual fields in which VET graduates complete their qualifications affected outcomes significantly. People with disabilities, people living in nonmetropolitan areas, and people from non-English-speaking backgrounds experienced poorer full-time employment rates than did other groups. Compared with university graduates, VET graduates were likely to be studying at any point in time or to have recently undertaken a training course. The following items are appended: VET qualifications in the 1997 SET; information on SET population coverage; regression results; and variable definitions. (Contains 53 references, 16 tables, and 6 figures.) (MN)

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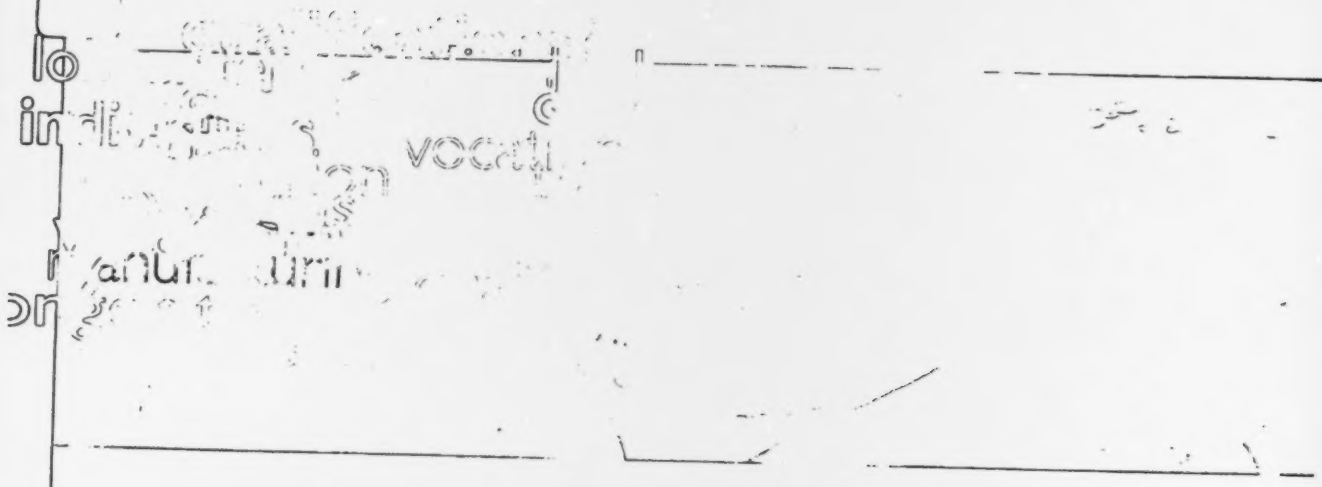

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Chris Ryan

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Chris Ryan

NCVER

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Acronyms

ABS	Australian Bureau of Statistics
ABSCQ	Australian Bureau of Statistics Classification of Qualifications
ANTA	Australian National Training Authority
ANU 3	Australian National University 3, an occupational status scale derived in Jones (1989)
AQF	Australian Qualifications Framework
ASCO	Australian Standard Classification of Occupations
KPM	key performance measure
NCVER	National Centre for Vocational Education Research
NESB	non-English-speaking background
RMIT	Royal Melbourne Institute of Technology
SES	socio-economic status
SET	1997 *Survey of education and training experience*
SEUP	*Survey of employment and unemployment patterns*
STE	1993 *Survey of training and education*
TAFE	technical and further education
VET	vocational education and training

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Jennifer Gibb of NCVER and an anonymous referee provided valuable comments on drafts of this report. Participants at the 10th Annual VET Training Research Conference at Deakin University, Geelong, in July 2001, provided helpful discussion on a paper that dealt with the longer-term employment outcomes described here. None of the above bear responsibility for the contents of this report.

Executive summary

This study aims to assess the longer-term effect for individuals of completion of vocational education and training (VET) qualifications. Specifically, its purpose is to identify how VET graduates' employment and education outcomes change over time after they complete their qualifications. Less is known about these longer-term outcomes than the short-term ones, since existing data provide considerable information about the immediate post-course activities of graduates.

Evidence on the post-course activities of the VET sector's graduates, such as their employment and further education participation rates, are used in this report as indicators of the VET sector's outcomes. Quite clearly, this focus on 'activities' is limiting—it excludes many other important, potential outcomes for individuals from participation in VET courses, as well as other economic, social and cultural outcomes for the community that go beyond those measured by the post-course activities of individuals. Nevertheless, the measures used are of considerable importance to its current and future students and to policymakers who provide public funds to the sector.

This study uses the 1993 *Survey of training and education experience* (1993 *STE*) and the 1997 *Survey of education and training experience* (1997 *SET*) collected by the Australian Bureau of Statistics (ABS) to identify the employment and education outcomes of individuals who undertook VET courses as they aged or gained more labour market experience. The two surveys provide two observations of the immediate experiences of recent graduates and of graduates from earlier years. At the same time, they provide two observations of individuals from the same cohorts at two different points in time. That is, the data allows the identification of the paths followed by different cohorts of graduates through time and their activities at any point in time. The fact that different individuals from a cohort are observed in the two surveys does not preclude estimation of these cohort effects, since the data are representative samples of the Australian workforce.

In this report, associate diploma graduates' outcomes are compared with those of individuals who completed Year 12 but completed no further education qualification. The outcomes of skilled and basic vocational qualification graduates are compared with individuals who did not complete Year 12 and did not undertake any post-school qualifications. The key results of the analysis follow.

1 *Completion of VET qualification improves the full-time employment outcomes of graduates compared to individuals who do not undertake post-school qualifications.*

Completion of a VET qualification effectively provides a two-tiered benefit to individuals. It increases the likelihood that they will work full time. Then, among those working full time, it increases their wage, occupation and permanent employment outcomes.

The full-time employment outcomes achieved by individuals who complete a VET qualification are significantly higher than their relevant comparison groups immediately after the groups enter the labour market. The VET qualifications appear to smooth the transition to full-time employment for graduates. Over time, differences between the employment outcomes of VET graduates and the comparison groups narrow, as the outcomes of the comparison groups improve.

2 *Male VET graduates appear to enjoy more substantial immediate benefits from completion of their qualifications than do female graduates, with differences in the impact of completion of a skilled vocational qualification lying at the heart of the divergence in outcomes. Further out from their courses, life-cycle factors also push male and female outcomes to diverge.*

The presence of children in their household pushes female outcomes down by more than males, while being married pushes male outcomes up more than female ones.

3 *The actual fields in which VET graduates complete their qualifications also have an impact on their outcomes, with some fields providing outcomes almost 20 percentage points lower than those of the business field.*

These differences between fields exceed those between VET qualification levels.

4 *People with a disability, people who live in non-metropolitan regions of Australia, and people from non-English-speaking backgrounds experience poorer full-time employment rates than other groups in Australia. However, there does not appear to be a VET-specific element to these outcomes.*

That is, the outcomes from VET participation for these groups appear no worse than other groups once their pre-existing levels of 'disadvantage' are taken into account. Older women may have poorer outcomes from VET than younger ones, though the opposite is true for male graduates. The small number of individuals who undertake their VET-level qualifications through 'Industry Skills, Skillshare or other government training centres' (and tend to complete basic vocational qualifications) have worse employment outcomes than VET graduates from other providers.

5 *Individuals who complete VET qualifications and work full time tend to enjoy higher wages, work in higher status occupations and have higher rates of permanent employment than members of their comparison groups.*

However, the profiles of these outcomes and the time since individuals completed their studies differ between the outcomes. The wages of VET graduates and the comparison groups converge, while the occupational outcomes diverge and the difference in the proportion of permanent employees remains constant.

6 *VET graduates appear less likely to be studying at any point in time or to have recently undertaken a training course than university graduates in the data sets used in this report.*

Consequently, a lower proportion of them is estimated to have completed a follow-up qualification within 15 years of completing their initial qualification (20% of VET graduates compared to 40% of university graduates). Participation in education falls with the time since individuals completed their previous education, but completion of a training course rises, at least up to 15 to 20 years after individuals completed their formal education. About half of all VET graduates who are studying at any point in time study in a TAFE, with a similar proportion choosing to undertake their further studies in the same field as their earlier one.

Unresolved issues

One important finding of this report is that the unemployment rate at their time of entry to the labour market has a permanent negative effect on the full-time employment rates of male cohorts. Although it supports the findings of at least one other Australian study of labour market outcomes, further work on the issue is probably necessary to confirm it. If validated, the importance of governments pursuing policies and programs that facilitate labour market entry during economic downturns is clear.

Other results presented here point to further questions. For example, a key element of the difference in full-time employment outcomes between males and females was directly related to the 'value' provided by the VET qualification to males compared with females. There were also considerable differences in longer-term employment outcomes between fields of study.

An important question is whether these differences in outcomes reflect differences in the learning experience provided by VET to males and females (or between courses in different fields), structural characteristics of the labour market, or the existence and operation of formal institutions that aid transitions to full-time employment. Identifying the contribution of these factors to these differences in employment outcomes would provide a better basis for improving employment outcomes for females and those from low-performing fields.

Finally, the evidence in the data used here suggests that participation by VET graduates in further education and training is lower than university graduates and possibly lower than Year 12 completers. This appears to be the case for both recent graduates (other than the most recent male university graduates in 1997) and those who completed their qualifications longer ago. If the results of this report are validated by further work to clarify some of the participation figures, the reasons behind these different participation patterns in further education and training need to be identified. An understanding of whether these differences are driven by differences in the way 'learning skills' are developed between the sectors, in views on the importance of skills upgrading and lifelong learning between graduates of the sectors or in the economic forces that shape the jobs of the sectors' graduates differentially would help identify an appropriate response. The first two factors are obviously more amenable to influence by the VET sector itself. If they are important in explaining the difference in participation in further education and training between the sectors, action within the VET sector can help expand its own market by developing the skills and shaping the attitudes to learning of its present student base.

Introduction

Evidence about the positive outcomes achieved by Vocational education and training (VET) participants is important in encouraging future participation by others and for justifying existing levels of public expenditure. Positive outcomes also encourage existing clients to return to up-grade their skills and competencies and to develop new ones.

A proper assessment of the impact of participation by individuals in a course of education and training must include its continuing effects. That is, it should answer whether completion of education and training courses provided continuing benefits to individuals. This study aims to assess the longer-term effect for individuals of completion of VET qualifications. Specifically, its purpose is to identify how VET graduates' employment and education outcomes change over time.

This report sets out to answer the following questions:

1 How do the observed labour market and education destinations of VET graduates change in the years following completion of their courses?

2 Do the outcomes differ according to the type of institution within the VET sector the individual attended? For example, do outcomes differ between the graduates of TAFE institutes and private colleges?

3 Do those groups of VET clients whose initial transition to the labour market appears difficult (such as women, young people, the disadvantaged and others with little prior labour market experience) enjoy improved outcomes over time? Does the gap in the outcomes between these groups and others narrow or widen?

4 What proportion of VET graduates eventually undertake a further course? Where VET graduates undertake subsequent courses, what sector do they undertake them in and do they study in similar fields to their earlier studies or do the fields tend to be unrelated?

In the next section, the current Australian literature on the outcomes of participation in VET is reviewed. The methodology and the data used in this report are described in the following section. An important limitation of the data for some of the issues analysed is noted there. The following section contains estimates of the longer-term employment outcomes of VET participation and the subsequent section the longer-term education and training outcomes. Following that, some conclusions and policy implications are drawn from the analysis.

Previous research on VET student outcomes

A description of the longer-term student outcomes analysed here

The purpose of this study is to identify how VET graduates' employment and education outcomes change over time. The focus on VET outcomes is therefore limited to individual education and training outcomes from participation in the sector. Clearly, VET institutions provide economic, social and cultural outcomes for the community that go beyond those measured by individual outcomes. Some of these other outcomes are described in Dumbrell (2000), who discusses their measurement and reviews relevant research. However, the outcomes analysed here are only a subset of those discussed in Dumbrell—those outcomes for individuals that reflect the effect of their participation in a course provided by the sector.

Evidence on the post-course activities of the sector's graduates, such as their employment and further education participation rates, are used in this report as indicators of its outcomes. Quite clearly, this focus on 'activities' is also limiting—it excludes many other important, potential outcomes from participation in VET courses. These other outcomes might include individual skill development, improved conceptual and analytical skills, and development of self-confidence and self-esteem. The focus on activities is not intended to deny the importance of such outcomes, but is adopted because it emphasises the 'end products'. That is, it seems reasonable to expect that any personal and skill development that might occur through participation in a course should be exemplified in more successful labour market and further education and training participation.

Therefore, in this report, employment outcomes are taken to include: the percentage of graduates who are employed (especially employed full time); the broad occupations in which they work; and the wages they receive.

In the sections where such employment outcomes are reported, the measures include:

- the proportion of individuals who completed a VET qualification working full time
- the distribution of those graduates working full time across the occupational classification used by the Australian Bureau of Statistics (ABS) and the conversion of that distribution into summary statistics using a specific occupational ranking
- whether full-time employees have permanent or casual employment
- the average wages of full-time employees

In all cases, comparisons are made between groups who completed their VET qualifications in different years and individuals who entered the labour market having completed some other educational level at about the same time as the VET graduates.

Where education outcomes are considered, the measures involve the percentage of graduates who engage in further education and training. The aim is to identify how this percentage changes over time and the forms of participation it involves, especially whether it involves further courses in the VET system.

Therefore, in the sections where education outcomes are described, the measures include:

- the proportion of individuals who completed a VET qualification studying at the time of survey or who had completed a further qualification in the intervening period
- of those studying or who had completed further study: the proportion whose studies are/were in the VET sector; and whether their subsequent studies were in a field of study related to their earlier qualification

Of course, not all clients of the VET sector complete qualifications. Some students enrol with the intention of completing only units or modules. The outcomes of that form of participation in VET are not considered in this report. Other students commence courses with the intention of completing them but do not do so (see Foyster et al. 2000 for discussion on what constitutes successful completion of a VET course of study and an analysis of completion by individual and course characteristic). The post-course outcomes of non-completers are also not analysed in this report.

Prior research on VET employment outcomes

Previous research that is informative about individual employment outcomes from VET participation can be grouped under three broad headings. The first is research that focusses on the VET sector and measures short-term employment outcomes. These studies are important in that they place estimates of VET's longer-term employment outcomes in context. The second group of studies includes research that focusses on the VET sector and contains longer-term employment outcome measures. The third grouping involves research that is not specifically focussed on VET outcomes, but is informative about them because the authors use VET-level qualifications to explain some employment-related phenomenon of interest. The following discussion of the relevant literature is grouped under these three research categories. Greatest emphasis in this review is given to studies that analyse similar measures to the outcome measures used here.

Studies that measure short-term VET employment outcomes

The assessment of the short-term outcomes of VET participation has been facilitated by the implementation since 1995 of the destination survey of recent graduates of TAFE colleges in Australia. Originally a survey of all TAFE course completers, it now also includes module completers and has been renamed the *Student outcomes survey*. Individuals typically are surveyed about six months after they completed their course or module and they are asked to provide detailed information about their circumstances and activities before, during and after their course or module.

The results of the *Student outcomes survey* are analysed in a very comprehensive summary in each national report by the National Centre for Vocational Education Research (NCVER) (see NCVER 2000, for example). The results have also been published by State agencies in a manner that involves direct comparisons of the outcomes of different TAFE institutions (for example, see Office of Training and Further Education 1998). Moreover, the survey results are also utilised extensively in the Australian National Training Authority's (ANTA) annual assessment of the performance of the VET system (see ANTA 2000).

The data inform the assessment of two of ANTA's key performance measures (KPMs) for the VET system: student employment outcomes from VET (KPM 4); and VET participation, outputs and outcomes achieved by client groups (KPM 5). Therefore, the student outcomes data are used extensively as a public accountability input for the VET system (and as a performance measure in some institutions—see Doran & Uren 2000, for example). Most studies that have utilised the data have either been undertaken by publicly funded agencies or by others on their behalf. It seems possible that the focus on use of the destinations survey as an accountability mechanism by government may have displaced its broader use as a research resource.

Dumbrell (2000) summarised some typical findings from analyses of the TAFE destination surveys: that about 70% of respondent graduates are employed by May of the year following completion of

their course, with the remainder split evenly between unemployment and being out of the labour force. About two-thirds of those whose main purpose for studying was a vocational one consider that their course of study wholly or partly achieved their aim. However, the employment and wage outcomes of women are inferior to those experienced by men. Other equity groups also experience poor employment outcomes.

Ball and Robinson (1998) reported that one-half of 15–19-year-olds who completed TAFE courses in 1994 were employed by the end of the course, while a further quarter of teenage graduates had found employment by May 1995. Ball (1999) reported similar figures for 1996 20–24-year-old graduates in early 1997. Older graduates experienced considerably lower employment outcomes, with more than a third of 55–64-year-olds out of the labour force. More than a third of young 1996 TAFE graduates (aged less than 25) were employed as *tradespersons* in 1997, with another quarter working as *salespersons* and *personal service workers*. Older graduates were less concentrated in these occupations, with more of them working in *management*, *professional* and *para-professional* occupations.

Ryan (2000) compared the short-term outcomes of VET and higher education participation using the destination surveys of 1997 graduates in early 1998. That research found that the employment outcomes of VET matched those delivered by the higher education sector. This remained the case even when pre-course employment rates were incorporated in the analysis.

One-half of TAFE graduates were employed full time after their course and a further quarter were employed part time. About 60% of VET graduates who were not employed prior to their course were employed after it.

In addition, these VET employment outcomes exceeded those of a group seeking employment over the same period from the broader population. This group was drawn from the *Survey of employment and unemployment patterns* (*SEUP*) collected by the Australian Bureau of Statistics (ABS) , a longitudinal study over about three years of two groups: one of 'jobseekers' and the other a group representative of the Australian population.

In general, higher education graduates obtained higher paid jobs, in part reflecting the different occupational distributions of the VET and higher education graduates. Not surprisingly, higher education graduates were much more likely to be employed in *professional* occupations than VET graduates. VET graduates tended to be employed in more skilled occupations than the general workforce and those employed before their courses tended to move into more skilled jobs after them.

Like other studies, Ryan (2000) found that there were substantial differences between the employment outcomes of different VET client groups. For example, female VET graduates experienced much lower employment outcomes than male graduates (up to 13 percentage points lower) and received lower wages (see also Dumbrell et al. 2000 for differences in wages between the genders). In the analysis of data from one multi-sector institution, Ryan (2000) found that much of this difference in employment outcomes reflected more extensive employment experience by males, both before and during their courses. Differences in the fields of study of the courses undertaken by males and females also contributed to the better employment outcomes achieved by males. The differences in female outcomes were much more pronounced in the VET outcomes than in the higher education ones.

Ball and Phan (1999) used data from two of the destination surveys to analyse the employment outcomes achieved by individuals from different VET client groups. These groups included women, individuals with disabilities, indigenous Australians, those from non-English-speaking backgrounds, those unemployed prior to their course, early school leavers, young graduates and mature-age graduates and people from rural Australia. The authors' analysis confirmed the poorer short-term employment outcomes from VET participation by individuals from these groups. With the exception of mature-age workers, the wage outcomes of these groups were also lower than those of other graduates. Phan and Ball (2001) report very small improvements in outcomes for graduates of 'enabling' courses from these same VET client groups compared to their pre-course activities. These courses are lower level preparatory and pre-vocational level qualifications, often involving remedial literacy and numeracy education.

In a study that used data similar to the destination surveys, Teese et al. (1998) reported on a survey of 1995 bachelor degree and associate diploma graduates from Victorian universities and TAFE institutions. The survey was undertaken in September 1996. The employment rates were quite similar to those from the respective destination surveys of the two sectors. About 80% of males, from both TAFE and higher education, were employed. Females from universities had higher employment rates (85%) than those from TAFE (74%). Women from both sectors were less likely to be employed full time in a job related to their field of study than were the males, however. The employment outcomes of graduates were strongly influenced by the pre-course activities of individuals. For example, about 70% of those employed full time prior to their course were employed full time in a job related to their field of study after it. For those unemployed prior to their course, the proportion was less than 40%.

The higher education graduates were more likely to be employed in professional occupations than the associate diploma graduates. The university graduates earned more than TAFE graduates, despite the greater labour market experience of TAFE graduates. Graduates in jobs—job-related to their course—expressed much higher levels of job satisfaction than others, whether the jobs were full-time jobs or not.

Phan (1999) reported on the first stage of a longitudinal study of South Australian VET graduates. Graduates were surveyed about six months after completion of their course, with subsequent stages of the study to involve surveys of the graduates up to two years after completion of their course. Just under half the respondents were employed full time six months after their course, with another third employed part time or on a casual basis. Overall, just over three-quarters of the graduates were employed, a proportion quite close to those given in the national graduate destination survey. Three-quarters of those employed indicated that their work was related to their course and almost all of them reported that their course had been very useful or of some use in their work.

Royal Melbourne Institute of Technology (RMIT 1996) reported on the student employment outcomes of 1993 RMIT VET graduates. These graduates were surveyed in both of the two years following the completion of their courses, though just one-half of the 1994 respondents replied to the 1995 survey. The results provide an 'extended' destinations picture of the experience of those graduates. The proportion of the 1993 graduates working full time was 54.3% in April 1994 and 66.0% in April 1995. The proportion seeking work fell by close to five percentage points over that time, as did the proportion in full-time study. About one-half of the 1995 respondents were in the same 'job' with the same organisation who employed them in 1994, while 10% had changed employers. All qualification levels showed increased employment outcomes between 1994 and 1995 of at least eight percentage points.

Male RMIT full-time employment rates exceeded female ones by 15 percentage points at both April 1994 and April 1995. Female part-time employment rates were about ten percentage points higher than the male rates.

The studies show quite a consistent picture of short-term outcomes for VET participants in the labour market. About half of them have full-time jobs after their courses and the overall outcomes continue to improve over time. However, VET participants from some backgrounds find the passage to employment more difficult to negotiate. Studies that use longitudinal data, such as those reported in RMIT (1996) and Phan (1999), are a good vehicle for identifying the longer-term effects of participation in VET by individuals. A number of such studies are described in the next subsection.

Studies that measure longer-term VET employment outcomes

Dumbrell (2000) concludes from his review of literature on measures of VET outcomes that:

> *The main shortcoming of the present method for measuring labour market outcomes, including earnings and labour market status, can be identified as the focus on the short-term outcomes of undertaking a course. No ongoing process exists for assessing whether any longer-term outcomes are achieved, despite the strong feeling of many VET providers that longer-term changes are of greater educational significance.* (Dumbrell 2000, p.31)

Given this conclusion, it is not surprising that there is no substantial literature that looks specifically at the longer-term outcomes for individuals of VET participation. Some projects have now commenced that will help to redress this situation, however. ANTA and NCVER have funded the collection of longitudinal data on VET students generally and more specifically, of apprentices and trainees.[1] Much of the existing literature to date has made use of longitudinal data.

Most longitudinal data available to study the longer-term effects of VET participation by individuals in Australia involve collections based on young people. These data sets include the various collections of the *Longitudinal survey of Australian youth* (LSAY) program, managed jointly by the Department of Education, Training and Youth Affairs (DETYA) and the Australian Council for Educational Research (ACER), and a longitudinal collection maintained by the Youth Research Centre (YRC) of the University of Melbourne.

Dumbrell (2000) cites one study that used longitudinal data from the LSAY collections, Long et al. (1996). Those authors found that completion of a VET qualification had a small positive effect on wages for males, but not females.

Further research by ACER on VET outcomes is contained in Lamb et al. (1998). In that study the authors also used data from the LSAY collections, the *Youth in transition* and the *Australian youth survey*, to analyse participation in vocational education and training and some of its outcomes. The authors' findings in relation to the effect of VET qualifications on wages match those of Long et al. (1996): a small positive effect for males, but none for females. Lamb et al. (1998) also compared unemployment rates for 24-year-olds with different levels of education. The unemployment rate was defined in the study as the percentage of respondents who reported being unemployed at any time over the previous 12 months. They made these comparisons across groups with different educational levels for the mid-1980s and mid-1990s.

For males, Lamb et al. found that the unemployment rates were not much different between higher education graduates, TAFE certificate and diploma graduates, apprentices, and Year 12 completers. These groups had substantially lower unemployment rates than those experienced by early school leavers and this differential increased between the mid-1980s and mid-1990s.

For females, TAFE certificate and diploma graduates and apprentices appear to have higher unemployment rates than early school leavers, though these figures ignore the greater labour market attachment of VET graduates. Only 5% of females who had completed some VET qualification by age 24 were out of the labour force, compared to about a quarter of those who undertook no post-school education and training. That is, the unemployment rate comparison may be misleading because the 'not in the labour force' group for female early school leavers may contain a larger hidden unemployment component than the TAFE qualification completer group.

Levels of longer-term unemployment (defined in the study as spending six or more of the previous 12 months unemployed) showed a similar pattern. VET qualifications were associated with lower longer-term unemployment than among early school leavers for males, especially in the mid-1990s. For females, VET graduates had comparable longer-term unemployment rates to Year 12 completers, but lower rates than early leavers. These differences were less marked than those between comparable male groups.

Lamb et al. (1998) also analysed the occupations where 24-year-olds with differing qualifications were employed. For both males and females, TAFE graduates with diplomas or certificates and those who had completed apprenticeships tended to be in more highly skilled occupations than those with no post-school education or training. Once more, though, the differences between those with VET qualifications and those without them were more marked for males than females.

The Youth Research Centre of the University of Melbourne maintains another longitudinal data collection that has been used to analyse the outcomes of young VET participants. Results from the analysis of that data set were published in Dwyer et al. (1997). However, rather than focus on the

[1] The Centre for Post-Compulsory Education and Training, made up of a team of researchers from the University of Melbourne (Educational Outcomes Research Unit) and RMIT University, has been funded to collect such longitudinal data.

activities of individuals, much of the emphasis has been on student aspirations, their perceptions about VET and comparisons between it and university. The research has looked at whether these perceptions of VET were subject to change, especially among VET participants. The research found that actual experience led to a positive re-assessment of VET. In addition, university students also tended to have quite positive assessments of some aspects of VET participation.

There are other studies that analyse the longer-term wage effects of VET course completion. These studies are summarised elsewhere and are not discussed in detail here.[3] The findings of that literature match those of Lamb et al. (1998). VET qualifications have a small, positive effect on male wages compared with early school leavers and, possibly, compared with those who complete Year 12. For females, the wage effects of qualifications other than associate diplomas are less pronounced.

Taken together, these studies provide only a very limited picture of the longer-term labour market outcomes for VET participants. They appear consistent with the view that the benefits of participation for males are more substantial than those for females and that such benefits that do exist are more pronounced in comparison with early school leavers than with those who complete school without undertaking further study.

Studies that estimate VET's effect on specific labour market outcomes

The third set of studies that implicitly captures VET outcomes involves studies that analyse some labour market phenomenon and use measures of education attainment that include VET qualifications. These studies often use cross-sectional data and are able to answer what the average effect of VET participation has been on the labour market variable of interest, where the average is estimated over individuals regardless of the length of time since they completed their qualification. Some of these studies are discussed briefly below.

Wages

Studies typically show that individuals with VET qualifications receive higher wages than those without post-school qualifications, especially early school leavers. These studies include Preston (1997), Gregory (1995), Miller and Mulvey (1996) and Borland et al. (2000). Their findings coincide with those described in the previous subsection. VET qualifications have a small, positive effect on male wages compared with early school leavers and, possibly, compared with those who complete Year 12. For females, the wage effects of qualifications other than associate diplomas are less pronounced.

Participation in training

Other research suggests that VET graduates are more likely to receive formal training than those with no post-school qualifications (Baker & Wooden 1992 and McKenzie & Long 1995). Participation in training appears to possess an inverted 'U' relationship with age—that is, it increases initially but declines at older ages. Baker and Wooden also found that those with diplomas or certificates had a higher probability of being engaged in further study than those who did not complete school, but those with trade qualifications did not.

Unemployment/employment

Harris (1996) found that 'diploma' qualifications lowered the likelihood that young males would be unemployed compared with those who completed Year 12, but that completion of a trade qualification did not. For females, post-school qualifications did not have an effect on unemployment incidence that was different from that of Year 12 completion. However, Marks and Fleming (1998) found that possession of a VET qualification did not reduce the incidence of unemployment or its duration. In fact, in some cases, unemployment incidence and its duration were higher for those with these qualifications for some cohorts.

[3] This literature is summarised in Ryan (2001).

Le and Miller (1999a) used the ABS *SEUP* data to analyse unemployment. They found that VET-level qualifications lowered the incidence of unemployment among individuals below that of early school leavers, but not necessarily lower than that of school completers. Persons with associate diplomas and basic vocational qualifications continued to have lower incidence of unemployment even after individuals' labour market history was included in the unemployment equation.

Kalb (2000) also used the *SEUP* and the related population panel to analyse individual labour market outcomes (in terms of higher employment rates and lower unemployment rates). Kalb reported that basic and skilled vocational qualifications did improve individuals' outcomes beyond those of individuals who completed school. Kalb did find that higher levels of education lowered the length of individuals' spells of job search. Using the same data, Stromback and Dockery (2000) also found that those with increased education had shorter spells of job search and, specifically, that it shortened spells of job search that ended when individuals found employment.

Borland et al. (2000) use the same data used here and report results that suggest that males with a certificate/diploma were just over 5% and those with trade qualifications about 3% more likely to be employed than male Year 12 completers.

Occupational outcomes

Le and Miller (1999b) analysed the occupational status of individuals, using a socio-economic status scale developed in Jones (1989) known as ANU 3. They also used the *SEUP* data. In the 'jobseeker' panel, they found that VET-level qualifications improved the occupational outcomes (and some other measures of job quality) of individuals above those experienced by early school leavers, but not Year 12 completers. In the broader population panel, the outcomes of individuals who completed school were higher than those with skilled or basic vocational qualifications, which in turn were higher than those of early school leavers.

Vella and Karmel (1999) compared two of the cohorts from the *Youth in transition* survey. They found that 21-year-olds with non-degree post-school qualifications were employed in higher socio-economic status occupations than those without post-school qualifications. However, the importance of the qualification may have been in where it placed individuals on the distribution of education rather than the effect of the qualification itself. The authors' purpose was to determine what effect the expansion of education over the 1980s had had on the occupational outcomes achieved by 21-year-olds in 1982 and 1991, since members of the latter group typically had higher education levels. They found that the occupational outcomes of the two groups at age 21 were the same.

Summary of the general labour market studies

Across a range of labour market outcomes, these studies also support the view that the benefits of VET participation are more pronounced in comparison with early school leavers than with those who complete school without undertaking further study. Where they do compare outcomes for males and females, they also tend to find that the benefits of participation for males are more substantial than those for females.

Studies that measure education outcomes

The *Student outcomes survey* questions individuals about further courses of study undertaken in the year following completion of a TAFE course or module. In the study that compared the destination surveys of the TAFE and higher education sectors, Ryan (2000) found that education continuation rates did differ between the sectors. A higher proportion of VET graduates undertook a further course in the year following their completed course than higher education graduates (39% compared with 27%). The education continuation rates differed among VET graduates. Some specific groups of TAFE graduates, such as 20–24-year-olds, had quite low continuation rates.

Phan and Ball (2001) reported on the education continuation rates and module completion rates of individuals who completed 'enabling' courses. The education continuation rates were estimated

from *Student outcomes surveys*. Those from non-English-speaking backgrounds were particularly likely to undertake a further course (over 70%), while about 50% of students from other equity groups undertook further studies.

Teese et al. (1998) reported education continuation rates in the data they collected similar to those in the destination surveys. Associate diploma graduates were more likely to be studying late in the year after completing their course than bachelor degree graduates (36% compared with 27%). In that study, Teese et al. reported that the associate diploma graduates were positive about their course—more than 80% agreed or strongly agreed that the course was effective in developing generic vocational skills and that it was relevant and practical in their present jobs.

RMIT (1996) reported that about 10% of its 1993 VET graduates were studying in 1995, down from 15.6% in 1994. While the enrolment rates for both genders fell, the decline was nine percentage points for females, compared to two for males. Of those studying in 1994 or 1995, close to one-half were studying full time. About 60% of those studying in 1994 undertook TAFE courses, with three-quarters of the remaining at RMIT. Of the remainder who attended a university, about one-half studied at RMIT. One-third to one-half of those undertaking new studies received some credit for their prior studies, particularly where they remained at RMIT.

As noted above, Baker and Wooden (1992) found that those with diplomas or certificates had a higher probability of being engaged in further study than those who did not complete school, but those with trade qualifications did not. School completers had the highest probability of engaging in study. Roussel (2000) found that participation in education rose with educational attainment and fell with age.

Other studies have analysed VET educational outcomes other than the ones considered here. For example, Foyster et al. (2000) estimate course completion rates, while Misko (2000) examines the impact of different delivery modes on student completion and their assessments of modules and O'Neill and Gish (2001) the English language and literacy skills of apprentices and trainees. While these are important educational outcomes, the focus here is on the post-course activities of individuals.

Implications and conclusions from the literature

There are a number of consistent findings across the studies that deal with the outcomes for participants of VET courses. In the labour market, the benefits of VET participation are more pronounced in comparison with early school leavers than with those who complete school without undertaking further study. The outcomes are better for males than females. The education outcomes appear to differ more by qualification completed than they do between males and females.

The main implication for the analysis conducted in subsequent sections is that the studies have highlighted the need to identify the appropriate group or groups to make comparisons against for graduates of the various VET qualifications.

Since completion of Year 12 or of Year 10, in conjunction with a related certificate course, are common prerequisites for entry into associate diploma courses, school completers seem the obvious comparison group for associate diploma graduates. An associate diploma represents a qualification that school completers could choose, at the margin, to undertake.

The outcomes of individuals with basic and skilled vocational qualifications will be compared with individuals who did not complete their schooling. School completion is not a prerequisite for these qualifications and most of those in the data sets used here with those qualifications would not have completed the highest level of school.

Methodology and data

Methodology

The purpose of this study is to identify the employment and education outcomes of individuals who undertook VET courses as they aged or gained more labour market experience. That is, the aim is to identify the paths followed by different cohorts of graduates through time and their activities at any point in time. Longitudinal data, which tracks the same individuals through time, is ideally suited to analyse these issues.

Collecting that type of data on individuals is expensive and it takes a long time to accumulate. While existing collections allow analysis of the post-course experiences of young VET participants, there are no comparable collections that cover older individuals. However, it is possible to construct quasi-panels of data through repeated surveys of the population. This allows the identification of the experience of specific cohorts to be differentiated from that of all recent graduates. Therefore, in this study the 1993 *Survey of training and education experience* (1993 *STE*) and the 1997 *Survey of education and training experience* (1997 *SET*) conducted by the ABS are analysed jointly. These surveys are described in the next subsection.

The two surveys provide two observations of the immediate experiences of recent graduates and of those some years after the completion of their courses. At the same time, they provide two observations of individuals from the same cohorts at two different points in time. The fact that different individuals from a cohort are observed in the two surveys does not preclude us from estimating these cohort effects, since the data are representative samples of the Australian workforce.

The actual analysis undertaken involves a combination of approaches. In some cases, simple cross-tabulations are used to show the proportion of individuals in some particular state (full- or part-time employment, studying or undertaking training and the like), by qualification level by the time since they either completed their qualification or left school. Some of these outcomes are also analysed using multivariate regression techniques. The exact form of the regression analysis depends upon the form of the outcome variable. Where the outcomes are discrete ones (for example, whether an individual works full time or not or has a permanent or casual job), probit estimation is undertaken. Where the outcomes are continuous (such as wages or some occupational outcome measure), least squares regression is used.

Data used in this analysis

The data used in this analysis are drawn from the two ABS surveys named in the previous section.

The 1993 *Survey of training and education* (1993 *STE*) was a dwellings-based survey that yielded 24 500 completed interviews. It was conducted during April and May in 1993. The data were collected through personal interviews.

The 1997 *Survey of education and training* (1997 *SET*) was also a dwellings-based survey and involved contact with over 30 000 individuals and yielded 22 704 completed interviews. It was

conducted between March and May in 1997. This survey was also undertaken through personal interviews.

The target populations for the 1997 *SET* survey were:

- persons aged 15–64 years who had worked as wage or salary earners in the previous 12 months
- persons aged 15–64 years who, at the time of the survey, were:
  - employed
  - unemployed
  - marginally attached to the labour force
  - aged 15–20 years and still at secondary school
  - not in the labour force, but who were studying, or had studied, in 1997

The target populations of the1997 *SET* extended the coverage of the 1993 *STE* by including:

- persons aged 15–20 who were still at school
- persons who studied at some time in the reference year, but who were not in the labour force
- persons who worked for payment in kind
- unpaid family helpers

In the analyses reported here, the coverage of the two surveys have been made comparable by excluding the groups added in the 1997 data set.

The information collected from individuals in both surveys included education, training and labour market history, as well as detailed information on present forms of participation in those activities. The data also included some socio-demographic information, along with information about the job characteristics of those presently employed.

The strength of the data sets for the purposes of this report lies in the extensive information they contain on individuals' educational attainment. Individuals reported details on their three highest post-school qualifications in 1997 *SET* (their two highest in 1993 *STE*), as well as the age at which they left school and whether they had completed the highest level of schooling possible. The qualification details included the provider type (in 1997 *SET*), when the qualification was completed, its field and level. Similar information on qualifications individuals failed to complete in recent years, or on short courses that did not lead to qualifications, were also collected in the 1997 *SET* survey, along with material on present courses of study.

Qualifications in the two surveys were coded using the ABS Classification of Qualifications (ABSCQ). Its structure included both field of study and level of attainment elements. The VET-level qualifications covered in the level of attainment classification were (these qualifications are described in more detail in appendix A):

- associate diplomas—which covered VET associate diploma and advanced certificate level qualifications
- skilled vocational qualifications—which covered apprenticeship and trade certificates
- basic vocational certificates—which covered pre-apprenticeship and pre-vocational courses, other certificates and traineeships. This classification was meant to include courses designed to provide the skills necessary to work as operatives in occupations.

One difference between the surveys was that computer assisted coding was used to code qualifications in the 1997 *SET*, but not the 1993 *STE*. This approach was used to match the education and training qualification details provided by individuals to ABS level of attainment and field of study codes. In the 1993 *STE*, respondents selected their own attainment level and field of study from prompt cards provided by their interviewer. The ABS (1998, p.84) reported that with this earlier method more people were likely to select the skilled vocational attainment level and less likely to select the basic vocational level. However, the ABS reported that the impact of the change between the surveys was difficult to quantify.

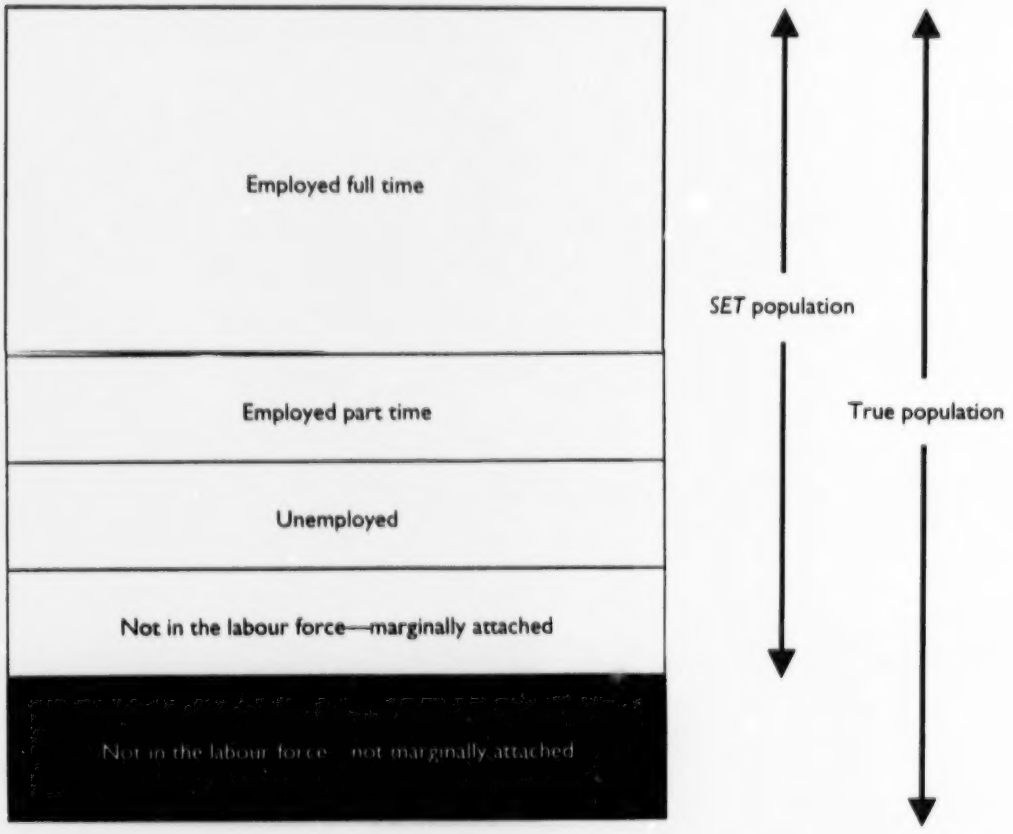
Limitations of the data

The key limitation of the data sets for the purposes of this paper is that they exclude those individuals who were not in the labour force and who were not 'marginally attached' to it. Those individuals who were either not actively looking for work or would only have been available to start work within four weeks if childcare was available are excluded. The exclusion of some individuals who are not in the labour force means that the surveys are not completely representative of the entire population aged 15 to 64. Consequently, any estimated employment to population ratios from the data are inaccurate, for example, since the information on the denominator is incomplete. The estimates overstate the employment outcomes of all groups, since the denominators are too low.

The situation is summarised in figure 1, where the coverage of the *SET* (and *STE*) population is compared to the entire population. Because the *SET* population excludes the 'not in the labour force—not marginally attached' group, the 'employed full time' to population proportion is too high compared to the figure that would be calculated from the entire population. It is possible to use other ABS data to obtain a more accurate picture of how the data coverage affects the estimated employment rates. This analysis is reported in appendix B.

More importantly for the analysis, labour force participation increases with educational attainment. That is, the data set must contain a higher proportion of the university and VET graduate populations than it does the population of individuals without post-school qualifications. This phenomenon is particularly marked for females, where labour force participation rates for those who did not complete school were almost 20 percentage points lower than tho[illegible] with VET-level qualifications in 1996. For males the difference was about ten percentage points.

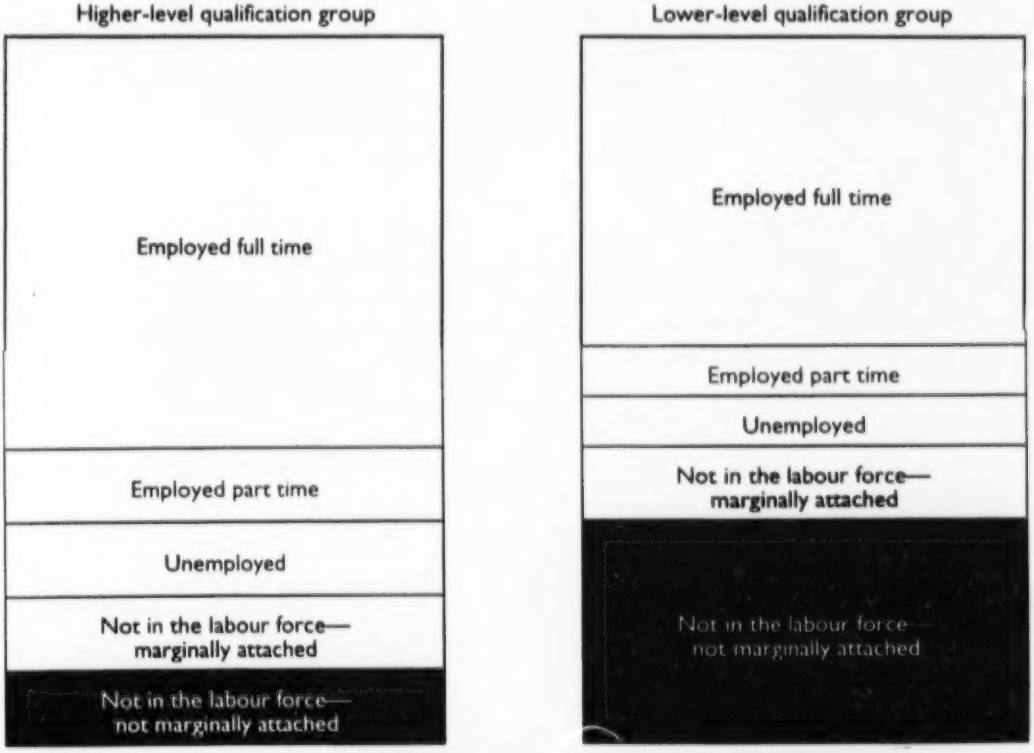
Figure 1: Population coverage in the *SET* data



This means that estimates of the effect of VET qualifications on employment outcomes compared to those without post-school qualifications will be understated. The extent of the bias is likely to be more substantial for females (and probably other equity groups) than males. This situation is highlighted in figure 2. There, the left-hand panel represents the distribution across labour market activities of a more educated group than the right-hand side panel. The *SET* data cover more of the population of the left-hand panel (the more educated group) than the right (based on the areas of the figures, 89% of the population versus 70%). Despite the difference the proportions working full time of the true populations (58% on the left-hand side versus 43% of the population on the right, based on the areas of the figures), estimates based on the *SET* data would be quite close (66% versus 62%).

Analysis reported in appendix B suggests that the extent of this type of bias is to understate the effect of VET qualifications on full-time employment outcomes by about 20% for males and 25% for females. One response to this problem is to weight the data, giving greatest weight to those marginally attached to the labour force, so that their weighted numbers reflect the entire 'not in the labour force' category. However, doing so requires the assumption that those marginally attached and those not attached to the labour force are alike in all other characteristics, which may be unrealistic. Another approach, followed here, is to estimate the proportion working full time of the labour force plus those marginally attached and to divide that proportion by the relevant *SET* 'over-estimate' of the population proportion reported in appendix B. This provides a 'corrected' estimate of the proportion of the population working full time.

Figure 2: Population coverage in the *SET* data for two different qualification groups



The problem described here does not affect all of the employment outcome measures used in this report, however. The relevant population for analysing wages and occupations is employed people, which the data sets cover completely. Therefore, while this limitation of the data needs to be emphasised for the analysis described here, it does not affect other important employment outcome measures.

Employment outcomes

Full-time employment outcomes

This section contains the results of an analysis of the full-time employment rates of groups of individuals who enter the labour market at roughly comparable times and how their education and training qualifications affect those outcomes. These outcomes are summarised in table 1, which contains the proportion of individuals in the two data sets working full time at the time of the respective surveys by gender, education level and the period when those individuals completed their education. Those without post-school qualifications obviously completed their education when they left school. For those with post-school qualifications, the completion of their education was estimated as the period when they either completed their only post-school qualification, or if they had more than one, their second-highest post-school qualification.[3] For those who completed more than one post-school qualification, their education level was left at their 'initial' qualification level, so that individuals who completed a university qualification after a VET one are reported among the outcomes for VET graduates. Someone who completed a post-school qualification after entrance to the labour market, however, is assigned to the level of their post-school qualification and their labour market experience prior to the completion of their qualification largely ignored.[4]

Since the analysis aims to identify the longer-term outcomes of the Australian VET system, the data used are limited to people who were, or conceivably could have been, its graduates. Only those individuals who were born in Australia, or were born overseas but completed their final years of schooling in Australia, were included in the data analysed. In addition, anyone aged 21 or younger who was studying full time at the time of the survey was excluded from the analysis. In this case, longer-term was treated as involving a period of less than 20 years after individuals entered the labour market. Since this left very few individuals in the sample aged 45 or older, all individuals aged 45 or older were also excluded. This approach also had the advantage of excluding those age groups where the *SET* data are least representative of the overall population. The resulting sample included over 9000 males (39% with VET qualifications) and 8000 females (27% with VET qualifications).

Table 1 contains a number of notable features.[5] The first is that the male and female full-time employment rates show quite different patterns as the time since completion of their education increases. The male rates increase, while the female ones peak some five to ten years after completion and then decline, presumably reflecting child-rearing responsibilities.

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[3] The 1993 survey collected information on individual's two highest post-school qualifications and the 1997 survey of their three highest qualifications. The approach adopted allows comparable treatment across the two surveys, but involves some loss of information from the 1997 data. This loss of information is small. Less than 6% of the 1997 survey provided useable information about the third highest post-school qualification.

[4] In the regression estimates such experience is reflected in the parameters on the age variables. In fact, these assumptions had little impact on the results. Alternative estimates that assigned individuals to their highest qualification were very similar to those presented here.

[5] As described in the methodology section, the estimates in table 1 are the full-time employed proportions estimated from the *SET* and *STE* data divided by the relevant 'correction' factors from table B1 in appendix B. In this case, the 15–24-year-old correction factors were used for the most recent labour market entrants (those who completed their education in the few years before the survey) and the 25–34-year-old factors for the other cohorts.

Secondly, regardless of the qualification and the time since completion of their education, male full-time employment rates are markedly higher than the female rates. In only two cases is the female rate better than ten percentage points lower than the comparable male rate.

Thirdly, males with post-school qualifications enjoy considerably higher full-time employment rates than those without them. However, the differences narrow with time since completion, particularly between those who completed the highest level of schooling and those with post-school qualifications. Females with VET qualifications enjoy higher full-time employment rates compared with those who complete the highest level of schooling initially, but lower later rates as their experience increases.

Table 1: Proportion of cohorts working full time by broad education level and gender

Education level	Period in which education was completed							
1997 SET	Males				Females			
	1995–97	1990–94	1985–89	1980–84	1995–97	1990–94	1985–89	1980–84
Not highest school	0.54	0.58	0.61	0.70	0.31	0.28	0.26	0.23
Highest school	0.33	0.57	0.79	0.83	0.20	0.43	0.40	0.34
VET	0.69	0.79	0.87	0.84	0.47	0.49	0.41	0.30
University	0.66	0.77	0.88	0.89	0.56	0.66	0.50	0.43

1993 STE	Males			Females		
	1990–93	1985–89	1980–84	1990–93	1985–89	1980–84
Not highest school	0.51	0.53	0.68	0.33	0.38	0.30
Highest school	0.52	0.51	0.74	0.37	0.43	0.47
VET	0.77	0.82	0.85	0.50	0.52	0.37
University	0.64	0.81	0.89	0.57	0.68	0.48

Source: Estimated from 1997 SET and 1993 STE data

Regression analysis: Time since completion of qualification

Regression analysis confirms these patterns. Separate probit estimates of the working full time outcome for males and females are reported in tables C1 and C2.[9] These results are of detailed specifications that allow for the full-time employment proportion time profile to differ between qualification levels. The tables differ in the specification of VET qualifications. In table C1 the VET qualifications are treated in aggregate, but differences by field of study are allowed. In table C2, basic and skilled vocational and associate diploma qualifications are distinguished in the VET sector, but differences by field are not estimated.[10] Before discussing those results, however, it is worthwhile to summarise results of simpler specifications in which the time profile followed by the full-time employment proportion is common across qualification levels. This provides a measure of the 'average' qualification effect on full-time employment outcomes. These results are summarised in table 2.

The various entries in table 2 show how many percentage points higher the full-time employment proportions of the identified qualification group was than the proportion for the group that did not complete the highest level of school. For example, male Year 12 completers had full-time employment outcomes that were 6.1 percentage points higher than those who did not complete school, after taking account of other influences (these are discussed below) on full-time

[9] The equations failed heteroskedasticity tests, a problem that results in the inconsistency of probit parameter estimates. Therefore, tests were undertaken to identify which of the explanatory variables the heteroskedasticity of the error term appeared to be related to and the equation was re-estimated assuming a form of multiplicative heteroskedasticity.

[10] Any attempt to distinguish disaggregated qualification by field of study effects would lead to very small numbers in many of the cells.

employment outcomes. The estimates show that males with VET qualifications had significantly higher full-time employment outcomes than those who did not complete school.[8] The estimated outcomes were higher for male VET graduates with skilled vocational or associate diploma qualifications than those with basic vocational qualifications. For females, the outcomes for those with skilled vocational qualifications were not much different from those of individuals who did not complete school, but graduates with basic vocational or associate diploma qualifications did experience superior outcomes. These are average effects, across all fields within qualification levels. As discussed in a later subsection, individuals from some fields of study have substantially better outcomes than others. Consequently, completion of a skilled vocational qualification in a 'good' field could still lead females to have better outcomes than completion of a basic vocational qualification from a 'bad' one. Overall, the results confirm the positive effect of completion of a VET qualification on full-time employment outcomes for individuals.

Table 2: Effect of education level on full-time employment outcomes

Educational attainment level	Males		Females	
	Effect	Effect/std. error	Effect	Effect/std. error
Completed Year 12	0.061	4.50	0.010	0.57
VET	0.141	9.74	0.059	3.09
Basic vocational	0.062	3.39	0.043	2.23
Skilled vocational	0.135	8.98	-0.017	-0.58
Associate diploma	0.123	5.06	0.113	3.66
University	0.178	9.83	0.148	7.27

Source: Regression estimates on 1997 *SET* and 1993 *STE* data.

Nevertheless, the time path followed by the full-time employment proportion after the completion of their education does differ substantially between education levels. These time paths implied by the regression results of table C1 for the full-time employment rate of different education groups is summarised in figure 3.[9] That figure contains the implied time path of the full-time employment rate of individuals who complete their qualifications at age 20 over the following 15 years.[10] The individuals are assumed to be unmarried and childless throughout the 15 years, but are assumed otherwise to have average characteristics for the other explanatory variables used in the probit regression equations.

The estimated patterns in the series in figure 3 reflect only the effects of differing qualification levels, the time since completion of individuals' education and the effect of ageing.[11] The estimates are somewhat lower than the observed figures that appear in table 1 for males and somewhat higher than the female figures in table 1. The series in figure 3 abstract from the effect of life-cycle phenomena such as marriage and child-rearing which have a (combined) positive

[8] In fact, the estimates in the table are drawn from two sets of regressions. The first distinguished the outcomes for Year 12 completers, all VET graduates and university graduates, on which the VET total figure is based. The second distinguished the three VET qualifications separately. This explains why the VET total for males is higher than any of the three separate qualifications—it is not their average.

[9] In fact, the results are not quite those presented in table C1. The figure is based on results of a specification like table C1, except that field of study effects were excluded. This means that the estimates for the VET qualification level in figure 3 are averages across all fields, rather than ones that relate to business.

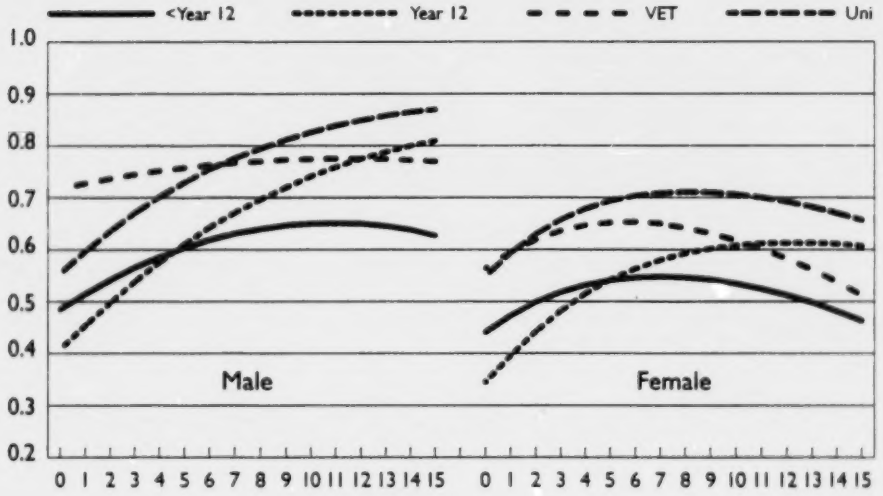
[10] The parameters of tables C1 and C2 are used to provide an estimate of the probability individuals with different characteristics will be employed full time. They provide an estimate of that probability within the *SET* population, that is among those in the labour force or marginally attached to it. The estimated probability is divided by the relevant estimate from table B1 of the extent to which *SET*-based proportions overestimate the true proportion in the population.

[11] Continuous age variables are used in the regression equations. Alternative specifications used dummy variables based on five-year interval age categories. Likelihood ratio tests did not reject the continuous approximation to the dummy variable approach in the male equation. They did in the female case, but the equations generated almost identical age 20 and 35 full-time employment rates for the educational categories. The distinguishing feature of the figures were 'kinks' at the transition ages between the age intervals. Use of the continuous variables smooths out these kinks, which are unlikely to be so prominent in reality, without changing the underlying pattern in the female post-course full-time employment profiles.

effect on employment outcomes for males and a negative one for females. These influences are discussed below.

For both males and females, the estimated full-time employment rate is initially higher for those with post-school qualifications, but some convergence between outcomes for those groups and those individuals who complete the highest level of school is evident in the estimates. In figure 3, the male full-time rates are higher than the female ones. In some circumstances, selection of or by individuals of an activity (in this case, their education level) muddies the true relationship between the activity and the outcome of interest (their full-time employment proportion). Specifically, self-selection may mean that the full-time employment outcomes achieved by individuals with specific qualifications may not provide a good guide to the outcomes other individuals would achieve if they acquired those same qualifications. There was no evidence that selection effects by individuals of their education level had any substantial impact on the estimated full-time employment rate results.[12]

Figure 3: Proportion working full time for different education levels by time since completion of education



The estimated starting full-time rates seem slightly higher for those with post-school qualifications than might be expected from the graduate destination surveys of the TAFE and higher education sectors. For example, in 1997 just 56% of 1996 TAFE graduates aged 20 to 24 were employed full time following their course, with the male rate likely to have been somewhat higher than the female rate. Among bachelor degree graduates aged less than 25, the proportion of females working full time was about 50%, with the male rate slightly higher. By contrast, figures from the ABS' publication *Transition from education to work*, suggest that the estimates for the initial full-time employment rates of those with school-level education are close to those actually achieved by such groups, including the apparent higher initial rates of those who leave school without completing the highest level.[13]

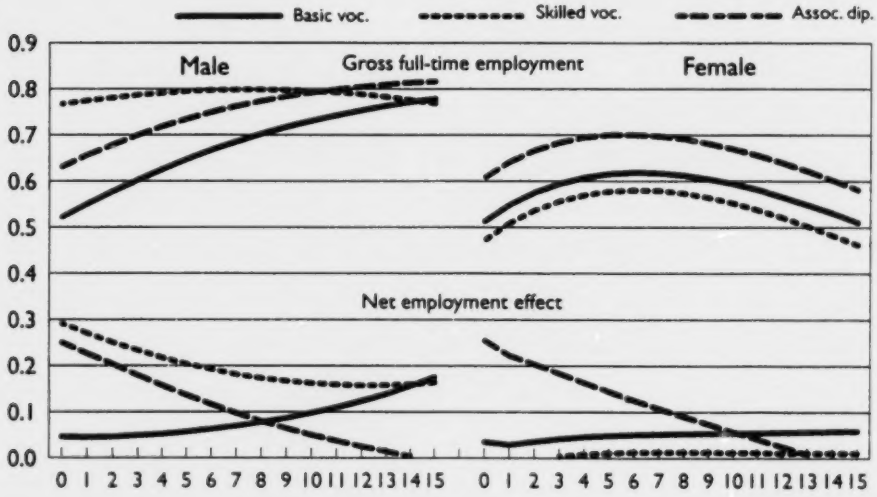
The estimated full-time employment rates for individuals with different types of VET qualifications based on the regression results reported in table C2 are presented in figure 4. The full-time

[12] Selection effects mean estimates of the effects of undertaking some course of action based on those who actually chose it are an unreliable guide to the true effect of that action on someone chosen randomly from the population. The presence of such effects in this case were tested by estimating a separate ordered probit equation of the education level attained by individuals. The generalised residual from this equation was included in the full-time employment probit equation, a technique used in Vella and Karmel (1999), for example. The additional variable was not significantly different from zero in either the male or female full-time employment equation, though it was significant in the equations used to explain some of the other employment outcomes.

[13] For example, in May 2000, 40% of those who left school after Year 12 in 1999 and were not enrolled in further study were employed full time. Among those who left school after completing Years 10 or 11 in 1999, 42% were employed full time (ABS 2000, p.26).

employment rates and their time profile are shown separately for those with associate diplomas and skilled and basic vocational qualifications. For males, skilled vocational qualifications provide high full-time employment outcomes that change little with time. Over time, however, the full-time employment rates of those with other VET-level qualifications approach those of the skilled vocational graduates. Fifteen years after completing their qualifications (and ignoring the impact of other factors that might change), just under 80% of male VET graduates are estimated to be employed full time.

Figure 4: Proportion working full time for different VET qualifications by time since completion of qualification



For females, the outcomes from skilled vocational qualifications are not as good as those provided by associate diplomas or basic vocational qualifications. In fact, the estimated initial full-time employment rates of females with associate diplomas or basic vocational qualifications are comparable to those of males, but those achieved by females with skilled vocational qualifications are almost 30 percentage points lower than the male outcomes. Such estimates do not match those of the TAFE destinations or graduate outcomes surveys in which the employment outcomes of females are substantially lower than males across all VET qualifications (see Ryan 2000, p.30). These lower destination survey outcomes probably reflect the effects of other demographic factors on female employment outcomes that are discussed below. Fifteen years after completing their qualifications, about 60% of (childless) female VET graduates are estimated to be employed full time.

The lower section of figure 4 contains a comparison of the VET qualification outcomes with those who did not undertake post-school qualifications. The full-time employment rate of associate diploma graduates is compared with those who completed the highest level of schooling and those of skilled and basic vocational graduates with those who did not complete the highest level of schooling. This comparison suggests that most VET qualifications provide a substantial positive effect on full-time employment rates for males and females. Over time, the differential tends to fall, but the benefit enjoyed by VET graduates appears to last for about a decade. Female graduates with skilled vocational qualifications do not have higher full-time employment outcomes than females who do not complete school, however.

Factors behind the difference in male and female employment outcomes

For a variety of reasons, the actual full-time employment outcomes achieved by women depart substantially from those of the 'hypothetical' person presented in figures 3 and 4 (see table 1). The main factor for this is their greater role in child rearing. The regression estimates contained in tables C1 and C2 suggest that while marriage may no longer be a bar to full-time employment for females (its estimated effect is positive), children are an effective barrier. The presence of a child aged less

than five years in their household reduces the probability of women working full time by almost 60 percentage points, while one aged five to 14 reduces the probability by about 40%. These children-related effects dwarf the effects of other characteristics on female full-time employment outcomes.

Being married also increases the probability that males work full time and the presence of children in their household affects male full-time employment outcomes in the same direction as females, though the effects are much less pronounced.

The regression parameters can be used to estimate the probability that someone with a set of characteristics would be employed full time. A male with 'average' male VET graduate characteristics has an 87% probability of working. A female with average female VET graduate characteristics has a 41% probability of working. It is possible to estimate whether differences in these employment outcomes reflect differences between the characteristics of male and female VET graduates or differences in the effect those variables have on their employment outcomes (through the estimated parameters).[14] The resulting decomposition suggests that almost 90% of the difference in employment outcomes reflects differences in the parameters of the male and female equations, with the balance reflecting differences in the characteristics of male and female VET graduates. The distribution of VET graduates across qualification levels makes a small contribution to this difference in characteristics.

However, most of the difference in employment outcomes arises because characteristics are 'rewarded' differently in the male and female equations. About 30% of the difference occurs because VET qualifications, particularly skilled vocational qualifications, have a greater impact on full-time employment outcomes for males than females. A further 30% of the difference is explained by the more positive effect of being married on male employment outcomes than female ones, with another 15% explained by the more negative effect of children on female employment than male employment. Field of study effects are among the other contributors to the balance of the difference in male and female employment.

Field of study effects on employment outcomes

The regression results reported in table C1 contain estimates of how field of study effects influence full-time employment outcomes for VET graduates. Ryan (2000) found that field of study effects were important in determining short-term full-time employment outcomes for TAFE graduates. Moreover, differences in the way males and females were distributed across the fields explained a large part of the poorer initial outcomes experienced by female VET graduates. Female graduates tended to be concentrated in fields with poorer destination employment outcomes.

The field of study parameters from table C1 have been converted to probabilities in table 3 to show how they affect full-time employment outcomes for VET graduates.[15]

Field of study effects also appear to be important in explaining the longer-term employment outcomes of VET graduates. Business and science courses provide better employment outcomes for females than humanities, engineering, education and 'miscellaneous' fields courses. For males, business and agricultural courses provide better employment outcomes than courses from other fields.

While males and females with VET qualifications tend to undertake them in different fields (see table D1), these differences appear to explain only a small part of the difference in longer-term outcomes between the genders described in the previous subsection. Males would have marginally worse employment outcomes if the female parameters applied to them, but females would be largely unaffected if the male parameters applied to them. These effects are dominated by the differences in the overall qualification effects, along with differences in the parameters associated with marriage and child-rearing.

[14] The decomposition of the difference into these effects follows Farber (1990) who generalised the decomposition methodology of Blinder (1973) and Oaxaca (1973) to models with binary dependent variables.

[15] The probabilities in table 3 are calculated at the mean values for all variables other than the qualification-related ones and the field of study variables.

Table 3: VET field of study effects on full-time employment outcomes

	Males		Females	
	Probability		Probability	
Business and administration	0.781		0.403	
Difference from business probability	Marginal effect	Effect/std. error	Marginal effect	Effect/std. error
Health	-0.182	-3.62	-0.046	-1.32
Education	-0.099	-0.70	-0.149	-1.57
Society and culture	-0.148	-3.11	-0.177	-5.05
Natural and physical sciences	-0.130	-3.23	0.060	1.23
Engineering	-0.010	-0.38	-0.096	-1.87
Architecture and building	-0.077	-2.55	-0.086	-0.86
Agriculture and related fields	0.014	0.32	-0.020	-0.26
Miscellaneous fields	-0.105	-3.40	-0.161	-5.56

Source: Regression estimates on 1997 *SET* and 1993 *STE* data.

Other aspects of the regression results

There are two further results of note from the regression estimates of tables C1 and C2. The first is that those males born overseas or whose English was so limited that their survey interview was conducted in a language other than English had lower full-time employment rates than the control individual in the equation, who was an Australian-born English speaker. This result occurs despite the fact that the data contains only individuals who either completed their schooling in Australia or undertook a VET qualification after their arrival here. Such individuals might be expected to be among the least disadvantaged groups of non-English-speaking background (NESB) migrants in the labour market.

The final result of note is that the unemployment rate at the time they entered the labour market had a negative effect on male full-time employment outcomes.[16] This suggests that those groups who have the misfortune to enter the labour market during recessions experience worse full-time employment outcomes in the longer term than those who enter during better times.[17] That is, the effects appear to be permanent.[18] The estimated magnitude suggests that the difference in full-time employment outcomes between cohorts entering at the top and bottom of the economic cycles (a difference of about four percentage points in the unemployment rate) would be close to six percentage points.

Summary: Full-time employment outcomes

The full-time employment outcomes achieved by individuals who complete a VET qualification are significantly higher than relevant comparison groups immediately after the groups enter the labour market. The VET qualifications appear to smooth the transition to full-time employment for graduates. Over time, differences between the employment outcomes of VET graduates and the comparison groups tend to narrow, as the outcomes of the comparison groups improve.

Male VET graduates appear to enjoy more substantial immediate benefits from completion of their qualifications than do female graduates, with differences in the impact of completion of a skilled

[16] This effect was evident only when specific cohort-entry dummy variables were included in the regression. Such an effect could not be picked up if only a single survey was used for the analysis.

[17] Other researchers have found similar effects in other Australian labour market contexts. For example, McDonald and Worswick (1999) find aggregate unemployment rates at their time of labour market entry had a permanent negative effect on the earnings of males in Australia.

[18] Inclusion of an interaction between the starting unemployment rate and time since completion of their education had no effect on the parameter of the starting unemployment rate and was not significant.

vocational qualification lying at the heart of the divergence in outcomes. Further out from their courses, life-cycle factors push male and female outcomes further apart. The presence of children in their household pushes female outcomes down by more than males, while being married pushes male outcomes up more than female outcomes.

The actual fields in which VET graduates complete their qualifications also have an impact on their outcomes, with some fields providing outcomes almost 20 percentage points lower than those of the business field. These differences between fields exceed those between VET qualification levels.

Full-time employment outcomes for other equity groups

The base case probit regression estimates of table C1 were supplemented with a succession of variables in an effort to identify whether key equity groups achieved similar or different outcomes from the remainder of the VET graduate body. Variables were also included to capture whether those outcomes diverged from or converged towards the outcomes achieved by the 'mainstream' as the time since the qualification was completed increased. These variables typically involved the interaction of equity group identifier and the VET qualification variable and/or the time since completion variable. In some cases, estimation was restricted to only one of the two data sets where the relevant equity variable was available in only one of the surveys.

The following subsections summarise the full-time employment outcomes by the age of the VET graduate, their language background, whether they had a disability, whether they were early school leavers and whether they lived in a metropolitan or non-metropolitan region of Australia. A final comparison analyses whether there were differences in the outcomes achieved by individuals whose qualifications were obtained at different VET provider institutions. For brevity, the results are described in summary form and the regression results are suppressed. In no case did the addition of the equity-related variables alter the results on the other variables in a substantial way from those presented in table C1.

Variations in full-time employment outcomes by age

The probit regression estimates of tables C1 and C2 indicate that as well as important age effects that influence the employment outcomes of individuals across all educational levels, there are separate age effects that influence the employment outcomes of VET graduates. There was no evidence of similar age effects for the other education levels. The estimated separate age effects for VET reflect complex interactions between age, VET qualifications and the time since completion of their qualification for VET graduates.

For males, the VET-specific effect of age on the outcomes of VET graduates operates through an interaction between age and the time since completion of the VET qualification. The coefficient is positive, which means that older graduates' outcomes (compared with their comparison groups of older individuals who complete no post-school qualifications) are relatively better than those achieved by younger graduates. Essentially, the rate at which the full-time employment outcomes of male VET graduates and their comparison groups converge is slightly slower for older graduates.

For females, the VET-specific effect of age on the outcomes of VET graduates also operated through an interaction between age and the time since completion of the VET qualification. The coefficient was negative in this case, suggesting that older female graduates outcomes (compared with their comparison groups of older individuals who complete no post-school qualifications) are relatively worse than those achieved by younger graduates, though the coefficient was not always significant across different specifications.

Full-time employment outcomes for those from non-English-speaking backgrounds

The results presented in table C1 indicate that across all educational groups, males from non-English-speaking backgrounds whose interview for the surveys was conducted in a language other than English had significantly poorer outcomes than those whose first language was English. For

females, there were no significant differences in the outcomes of those from English and non-English-speaking backgrounds.

VET graduates from non-English-speaking backgrounds did not experience full-time employment outcomes that were significantly different from those of English-speaking VET graduates of their gender. It should be kept in mind here that individuals who migrated to Australia as adults after they had completed their education were excluded from the sample of individuals analysed. Therefore the number of VET-level graduates of non-English-speaking backgrounds was quite small in the data analysed (about 6% of male graduates and 9% of female ones) and those who were in the data had arrived in Australia prior to completing their education.

Full-time employment outcomes for those with disabilities

Individuals with disabilities were identified only in the 1997 *SET* data. Consequently, analysis of their full-time employment outcomes involved the estimation of a regression equation for that year only, with variables included that identified those with disabilities and those with VET qualifications with disabilities, as well as interactions with the time individuals had held their qualifications.

For both males and females across all education levels, disabled individuals were less likely to work full time. Disabled males and females were about 13% and 8% respectively less likely to be working full time than individuals who were not disabled. However, there was no evidence of any specific effect on the full-time employment outcomes of disabled individuals with VET qualifications or of an effect that changed with the time individuals had held their qualifications. The outcomes of disabled individuals were worse than those achieved by other VET graduates, but only by the difference identified above that operated across all education levels.

Full-time employment outcomes for early school leavers

There was no evidence that the full-time employment outcomes achieved by individuals who left school aged 16 or younger were worse than those achieved by other VET graduates. Where variables that identified early school leavers with VET qualifications and how long they had held those qualifications were included in regression equations for males and females, the relevant variables were never significantly different from zero.

Full-time employment outcomes for non-metropolitan regions

Similarly, full-time employment outcomes for VET graduates who lived in non-metropolitan regions of Australia were no worse than those from metropolitan regions. Across all education levels, females in non-metropolitan regions appeared to be 8% less likely to work full time than those in metropolitan regions. However, there was no evidence of a specific VET effect in the outcomes. These estimates are based on the 1993 *STE* data since only that data included this regional identifier.

Full-time employment outcomes by provider-type

The 1997 *SET* data identified the type of institution at which individuals undertook their studies. Therefore, it is possible to identify whether the full-time employment outcomes of those with VET-level qualifications varied according to the type of institution at which individuals studied. These outcomes are summarised in table 4. The main feature of the table is the poorer outcomes achieved by individuals who completed their qualifications at 'Industry Skills, Skillshare or other government training centres'. Individuals in this category constituted just over 3% and 4% of male and female VET graduates respectively.

Summary: Equity outcomes and differences by provider type

Individuals with disabilities, who live in non-metropolitan regions of Australia, or who come from non-English-speaking backgrounds, experience poorer full-time employment rates than other groups in Australia. However, there does not appear to be a VET-specific element to these

outcomes—that is, their outcomes from VET participation appear no worse than other groups once their pre-existing levels of 'disadvantage' are taken into account. Older women may have poorer outcomes from VET than younger ones, though the opposite is true for male graduates. The small number of individuals who undertake their VET-level qualifications through 'Industry Skills, Skillshare or other government training centres' have significantly worse employment outcomes than VET graduates from other providers. The vast majority of these individuals had completed basic vocational qualifications.

Table 4: Provider-type effects on full-time employment outcomes for VET graduates

VET providers	Males	Females
TAFE/technical college	0.784	0.394
Business college or adult/community education centre	0.743	0.446
Industry Skills, Skillshare or other government training centre	0.599*	0.189*
Professional/industry association	0.822	0.451
Other private training organisation	0.727	0.407

Source: Regression estimates on 1997 *SET* and 1993 *STE* data.

* Indicates significant difference from the outcomes of TAFE/technical college graduates.

Other employment outcomes among those employed full time

This section contains summary details of other employment outcomes for individuals. The wage, occupation and casual/permanent employment status of individuals working full time are analysed here to identify whether VET graduates achieve better outcomes than their comparison groups. The discussion of these outcomes is brief and detailed results are not presented, since the results tend to provide a consistent picture. Not only are VET graduates more likely to be employed full time than members of their comparison groups, but VET graduates employed full time achieve better outcomes than members of their comparison groups who are also employed full time.

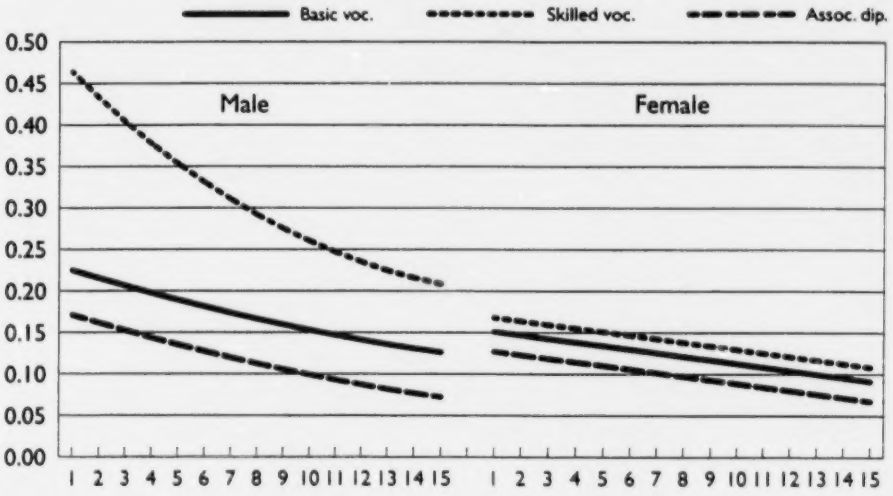
Wages

A companion study, Ryan (2001) analyses the effects of the possession of VET qualifications on the wages of full-time employees with the purpose of estimating rates of return to VET qualifications. That study uses the 1997 *SET* data. The study contains estimates of the effect of VET qualifications on wages and how that effect changes with the length of time employees have held the qualification. Rather than replicate that work, the results of that study are summarised here.

The key finding from that study for this report is that, relative to their respective comparison groups, the increase in the wages of employees with VET qualifications is about 10%. That is, associate diploma graduates are paid about 10% more than Year 12 completers and basic and skilled vocational qualification graduates about 10% more than individuals who did not complete the highest level of schooling. These increments are slightly higher for males and a bit below 10% for females. In addition, the wages of employees with VET qualifications vary between qualification levels—individuals with associate diplomas are paid significantly more than those with skilled or basic vocational qualifications. The difference is also of the order of 10%.

Also of note for this study was that the estimated wage-experience profile of VET graduates was considerably flatter than other individuals in the labour market, which means that their wages grow more slowly than others. In the companion study it was surmised that this may reflect different rates or types of post-entry training that different groups of employees undertake. These flatter wage-experience profiles for VET graduates are reflected in figure 5, which shows how the wage increment associated with VET qualifications falls with the time since individuals complete their education and training.

Figure 5: Wage outcomes by gender and VET qualification level—percentage point increment above comparison groups and time since completion of qualification



Occupational outcomes

Among those working full time, VET graduates had only marginally better occupational outcomes than individuals with lower levels of education. The occupational descriptor used for this analysis is the ANU 3 scale described in Jones (1989). It is a measure of the socio-economic status (SES) of the occupation and is defined for major, minor and unit group occupations for the ABS' Australian Standard Classification of Occupations first edition (ASCO I).[19] The socio-economic status of an occupation encompasses its prestige, educational requirements and typical remuneration levels.

Average ANU 3 scores for individuals employed full time by broad educational attainment level are reported in table 5. The ANU 3 scale is bounded between zero (the lowest occupation in terms of socio-economic status) and 100 at the unit group level, but between about ten and 65 at the ASCO major group level. Its mean value is 34.8 at the unit group level. Trade occupations have below-average SES scores in the ANU 3 scale, with the average for the trade major group at just under 25. From table 5, VET graduates are typically employed in occupations that are just below average in terms of their occupational socio-economic status. These jobs are comparable to those where individuals who completed Year 12 at school also work.

Based on regression analysis, it appears that male associate diploma graduates work in higher SES occupations than Year 12 completers, but that over time the occupational status of Year 12 completers rises relative to associate diploma graduates. In contrast, male skilled or basic vocational qualification graduates do not appear to fill higher status jobs than non-Year 12 completers initially, but achieve higher status SES occupations than them as the time since they completed their VET qualifications increases.[20] Male VET graduates from engineering, architecture and building and miscellaneous fields tended to be employed in lower SES status occupations than graduates from the business field. Health and natural and physical science graduates tend to be employed in higher SES status occupations.

For female VET graduates, the occupational status of their jobs increased relative to their comparison group as the time since they completed their initial education increased. That is, the SES status of the occupations of associate diploma graduates increased over time compared to Year 12 completers and

[19] The 1997 *SET* data contains data on the major group ASCO I classification for individuals and the 1993 *STE* data the minor group ASCO I classification, which can be used to assign individuals to the appropriate major group. Individuals were therefore assigned the relevant ASCO I major group value for the purpose of the analysis reported in the text.

[20] It seems likely that self-selection would affect analysis of this issue. The choices of education level and field and occupation would be expected to be closely related. Efforts to correct for self-selection via a Heckman (1979) correction term, generalised to multiple education levels as in Vella and Gregory (1996) had little impact on the results, however.

the status of skilled and basic vocational qualification graduates increased compared to non-completers of Year 12. There were no significant differences between VET qualification levels on the SES status of the occupations in which female graduates were initially employed after completing their studies. Graduates from health, education, society and culture, natural and physical sciences and engineering were employed in higher status occupations than other VET graduates.

Table 5: Occupational outcomes by education level (ANU 3 scale)

Educational attainment level	Males	Females
Not highest school	22.1	27.1
Highest school	30.0	31.3
VET	30.2	32.0
University	53.8	52.4

Source: Estimated from 1997 SET and 1993 STE data.

Casual employment

The proportion of full-time employees working in casual jobs falls with educational attainment. This pattern is reflected in table 6 for both males and females. Regression analysis confirms this pattern. For males, graduates with skilled or basic vocational qualifications working full time were less likely to be working as casuals than those who did not complete Year 12. In addition, male associate diploma graduates were less likely to be working as casuals than both Year 12 completers or non-completers. For females, graduates with skilled or basic vocational qualifications working full time were less likely to be working as casuals than those who did not complete Year 12. Female associate diploma graduates were not less likely to be working as casuals than either Year 12 completers or non-completers. For neither gender were there significant VET-level effects for individuals as their experience or time since they completed their qualification increased.

Table 6: Proportion of full-time employees who worked as casuals by education level

Educational attainment level	Males	Females
Not highest school	0.144	0.110
Highest school	0.120	0.097
VET	0.096	0.073
University	0.053	0.067

Source: Estimated from 1997 SET and 1993 STE data.

Summary: Other full-time employment

Individuals who complete VET qualifications and work full time tend to enjoy higher wages, work in higher status occupations and have higher rates of permanent employment than members of their comparison groups. However, the profiles of these outcomes and the time since individuals completed their studies differ between the outcomes. The wages of VET graduates and the comparison groups converge, while the occupational outcomes tend to diverge and the difference in the proportion of employees employed on a permanent basis remains constant.

Part-time employment outcomes

Part-time employment rates are presented in table 7. In many respects, these are a mirror image of the full-time employment outcomes. The female part-time employment rates are higher than the male ones. The male rates fall with time since the completion of individuals' initial post-school qualification or when they left school, while the female rates tend to increase. For males, the part-

time employment rates tend to be lower for those with higher education levels, especially those with VET qualifications, while the differences are less pronounced between women who complete Year 12 and those with post-school qualifications.

Summary: Employment outcomes

The analysis of this chapter suggests that completion of VET qualifications improves the full-time employment outcomes of graduates compared to individuals who do not undertake post-school qualifications. Completion of a VET qualification effectively provides a two-tiered benefit to individuals. It increases the likelihood that they will work full time. Then, among those working full time, it increases their wage, occupation and permanent employment outcomes.

For most employment outcome measures analysed here, VET qualifications provide an immediate benefit to graduates compared with non-graduates, but over time the magnitude of the benefit falls. This pattern is particularly evident in the full-time employment and wage outcome measures. These benefits enjoyed by VET graduates are more pronounced for males than for females.

Table 7: Proportion of cohorts working part time by broad education level and gender

Education level	Period in which education was completed							
1997 SET	Males				Females			
	1995–97	*1990–94*	*1985–89*	*1980–84*	*1995–97*	*1990–94*	*1985–89*	*1980–84*
Not highest school	0.13	0.09	0.11	0.08	0.12	0.19	0.22	0.28
Highest school	0.34	0.16	0.09	0.07	0.41	0.28	0.29	0.31
VET	0.10	0.08	0.05	0.08	0.31	0.30	0.26	0.34
University	0.16	0.09	0.06	0.05	0.30	0.23	0.30	0.38

1993 STE	Males			Females		
	1990–93	*1985–89*	*1980–84*	*1990–93*	*1985–89*	*1980–84*
Not highest school	0.11	0.11	0.05	0.15	0.17	0.18
Highest school	0.19	0.18	0.09	0.27	0.23	0.21
VET	0.07	0.05	0.05	0.25	0.28	0.32
University	0.14	0.05	0.06	0.27	0.21	0.33

Source: Estimated from *1997 SET* and *1993 STE* data

Education outcomes

This section contains analysis of the education and training outcomes of those with differing levels of education and how these outcomes vary according to how long ago individuals completed their education. The specific issues analysed include participation in and completion of further educational qualifications, whether those studies are undertaken within the TAFE sector and the incidence of training among those with differing levels of education. It is worth recalling here that all full-time students aged 21 or younger are excluded from the data analysed, so that the education and training patterns analysed here are not unduly influenced by young people engaging in full-time post-school studies straight from school.

The education and training outcomes analysed provide evidence about the way that VET graduates upgrade their skills and capabilities throughout their careers and the extent to which they make further use of the VET sector. This evidence is informative for government policies designed to promote lifelong learning and for the VET sector in identifying how well it exploits one potential market, its past students.

Individuals studying at the time of the survey

Table 8 contains the estimated proportion of individuals who were studying at the time of the 1993 and 1997 surveys by broad educational qualification level and when they completed their schooling or their initial post-school qualification. More recent, younger graduates are more likely to study than those who have held their qualifications for longer, as found in previous research (for example, Roussel 2000).

VET graduates appear less likely to be studying at a point in time than university graduates. Close to a quarter of recent VET graduates were studying, a number that is somewhat lower than the estimates from the *Student outcomes survey* (see Ryan 2000). About one in ten of those who had held their VET qualifications for longer than a decade were studying. This pattern for VET graduates is common for both genders in both survey years. The same is not true for university graduates. The 1997 figures show a much lower proportion of recent university graduates undertaking a further course than the 1993 figures. A number of changes introduced between the surveys affected the costs of higher education students undertaking postgrad uate studies. Full up-front fees were charged on a wider range of courses and HECS arrangements were changed for students commencing courses from 1997, with the introduction of a three-tier charging regime that increased the real cost to university students commencing courses from that year.[21]

Another feature of table 8 is that a significant proportion of recent school leavers (not studying full time) were, nevertheless, undertaking an educational qualification. Almost one-half of recent Year

[21] Anderson et al. (1997) characterised the extension of postgrad uate fees as one where 'from being initially tolerated, fees are now being encouraged' following Commonwealth Government funding arrangements on higher education announced at the time of the 1996 Budget (1997, p.xv).

12 completers were studying in 1997, up sharply from the 1993 survey.[22] One-third of recent male early school leavers were also studying, a figure double that for female early school leavers.

Table 8: Proportion of cohorts studying by education level and gender, 1993 and 1997

Education level	Period in which their initial education was completed							
1997 SET	Males				Females			
	1995–97	1990–94	1985–89	1980–84	1995–97	1990–94	1985–89	1980–84
Not highest school	0.35	0.24	0.05	0.06	0.16	0.12	0.03	0.04
Highest school	0.47	0.36	0.18	0.17	0.44	0.26	0.14	0.09
VET	0.23	0.13	0.13	0.09	0.23	0.15	0.11	0.07
University	0.16	0.28	0.19	0.12	0.25	0.24	0.20	0.12

1993 STE	Males			Females		
	1990–93	1985–89	1980–84	1990–93	1985–89	1980–84
Not highest school	0.28	0.09	0.06	0.15	0.08	0.06
Highest school	0.31	0.42	0.25	0.29	0.28	0.13
VET	0.24	0.12	0.10	0.23	0.14	0.11
University	0.31	0.30	0.19	0.38	0.22	0.16

Source: Estimated from 1997 SET and 1993 STE data

Table 9 contains the proportion of individuals who were studying at a TAFE institute by broad educational qualification level, again by when they completed their schooling or their initial post-school qualification. Male early school leavers tend to study at TAFE institutes, presumably reflecting male-dominated apprenticeship training. However, substantial proportions of both male and female recent Year 12 leavers were studying at a TAFE. Little of the increase in the proportion of recent Year 12 leavers studying between 1993 and 1997 was reflected in studying at TAFE institutes, suggesting that this was largely a university-related increase in education participation. About one-half of recent VET graduates undertake their further studies at a TAFE institute, a choice also made by a small proportion of recent university graduates. The proportions of male and female VET graduates studying and studying at TAFE in 1997 are shown in figure 6.

Individuals who had more than one post-school qualification

With the passage of time, many individuals build on their initial post-school qualifications with further qualifications. Table 10 shows the proportion of individuals who had completed at least one follow-up qualification by initial post-school qualification level and when they completed their initial qualification. It appears that by about 10 to 15 years after the completion of their first qualification about 20% of both male and female VET graduates had completed further qualifications. This proportion is about half the proportion of male and female university graduates who complete further qualifications.[23]

[22] It is possible that this apparent rise simply reflects a decline in the population of Year 12 leavers who do not proceed to further full-time study and who were, hence, excluded from the sample analysed.

[23] The 1997 proportion of female university graduates who completed their course in the period 1980 to 1984 appears too low at 26%. The 1993 figure for the same cohort is higher, as is the figure for the 1985 to 1989 cohort in 1997. A figure like the male one of about 40% seems more plausible.

Table 9: Proportion of cohorts studying at a TAFE in the survey year by broad education level and gender

Education level	Period in which previous education was completed							
1997 SET	Males				Females			
	1995–97	1990–94	1985–89	1980–84	1995–97	1990–94	1985–89	1980–84
Not highest school	0.28	0.20	0.03	0.04	0.04	0.06	0.00	0.02
Highest school	0.18	0.18	0.07	0.04	0.15	0.08	0.03	0.03
VET	0.13	0.05	0.05	0.04	0.12	0.04	0.03	0.03
University	0.02	0.03	0.01	0.02	0.01	0.02	0.03	0.01

1993 STE	Males			Females		
	1990–93	1985–89	1980–84	1990–93	1985–89	1980–84
Not highest school	0.25	0.08	0.04	0.11	0.05	0.03
Highest school	0.23	0.14	0.08	0.18	0.05	0.04
VET	0.15	0.06	0.05	0.11	0.06	0.06
University	0.01	0.03	0.01	0.03	0.02	0.03

Source: Estimated from 1997 SET and 1993 STE data

Figure 6: Proportion of VET graduates studying in 1997 and whether they were studying at TAFE

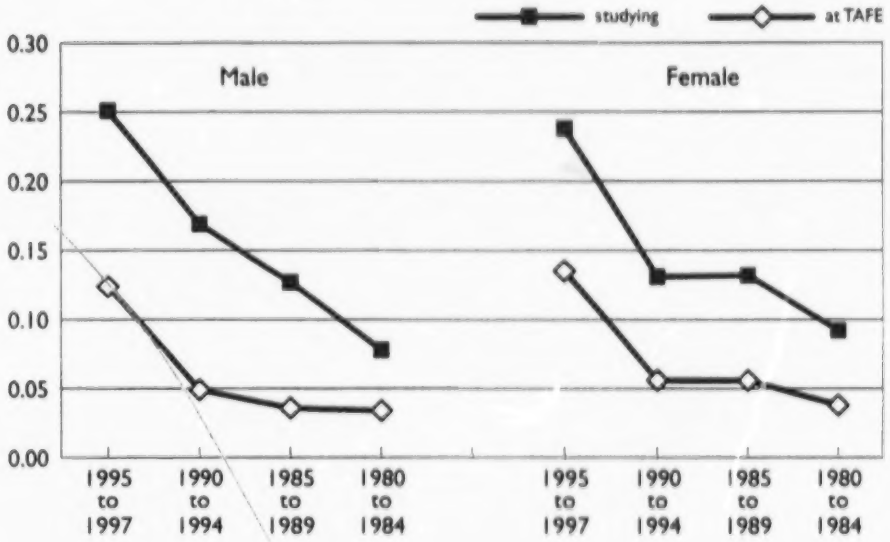


Table 10: Proportion of cohorts who had completed a further qualification by the survey year by broad education level and gender

Education level	Period in which previous education was completed							
1997 SET	Males				Females			
	1995–97	1990–94	1985–89	1980–84	1995–97	1990–94	1985–89	1980–84
VET	0.12	0.19	0.20	0.20	0.13	0.20	0.19	0.20
University	0.06	0.23	0.41	0.42	0.04	0.20	0.38	0.26

1993 STE	Males			Females		
	1990–93	1985–89	1980–84	1990–93	1985–89	1980–84
VET	0.11	0.12	0.20	0.13	0.14	0.15
University	0.10	0.26	0.41	0.12	0.25	0.39

Source: Estimated from 1997 *SET* and 1993 *STE* data.

Individuals who are either studying or have completed a further post-school qualification tend to undertake it in the same field as their initial qualification. This effect is more pronounced for males in VET than females, but for females with university qualifications than males. These percentages appear in table 11.

Table 11: Proportion of cohorts studying or who had completed a further qualification in the same field as their initial qualification by broad education level and gender

Education level	Period in which previous education was completed							
1997 SET	Males				Females			
	1995–97	1990–94	1985–89	1980–84	1995–97	1990–94	1985–89	1980–84
VET	58.0	60.9	65.6	69.5	49.0	54.3	57.9	63.5
University	74.1	58.8	65.3	59.6	79.6	69.3	67.1	71.1

1993 STE	Males			Females		
	1990–93	1985–89	1980–84	1990–93	1985–89	1980–84
VET	73.2	77.1	69.1	63.4	53.8	49.3
University	66.2	69.4	57.3	75.2	65.4	68.8

Source: Estimated from 1997 *SET* and 1993 *STE* data.

Employed individuals who undertook a training course in the previous twelve months

A substantial proportion of employed VET graduates undertook at least one training course in the 12 months prior to the two surveys. These proportions are presented in table 12. In general, more individuals reported undertaking a training course in the 1997 survey than the 1993 one. In both years and across all education levels, the incidence of training broadly increases with the period since individuals completed their schooling or initial post-school qualifications in this sample of workers aged less than 45 years. This is consistent with previous research which indicates that the incidence of training follows an inverted 'U' shape over individuals' entire careers (see Baker & Wooden 1992 or Roussel 2000, for example).

Almost one-half of males with VET qualifications had undertaken a training course in the 12 months preceding the 1997 survey, while a slightly smaller proportion of females with VET qualifications had undertaken a training course. University graduates had higher levels of training course incidence than individuals with other education levels. Blandy et al. (2000) report that such training for university graduates is often of shorter duration than that given to others, particularly those who complete Year 12 without undertaking post-school qualifications. However, even if the incidence of participation in training does rise with education level, it may have little to do with any causal effect of higher levels of education on the propensity to undertake training. Ryan and Watson (2001) analyse the 1997 *SET* data and find that unobserved factors (such as their tastes for learning) that induce individuals to undertake higher levels of education also lead them to undertake more training. After taking such factors into account, there appeared to be no positive effect of education level on the propensity to undertake training.

Table 12: Proportion of those employed in cohorts who undertook a training course in the survey year by broad education level and gender

Education level	Period in which previous education was completed							
1997 *SET*	Males				Females			
	1995–97	*1990–94*	*1985–89*	*1980–84*	*1995–97*	*1990–94*	*1985–89*	*1980–84*
Not highest school	0.17	0.26	0.27	0.35	0.24	0.32	0.25	0.32
Highest school	0.27	0.40	0.53	0.52	0.36	0.42	0.42	0.42
VET	0.40	0.48	0.51	0.53	0.44	0.43	0.47	0.42
University	0.56	0.66	0.75	0.74	0.57	0.68	0.67	0.65

1993 *STE*	Males			Females		
	1990–93	*1985–89*	*1980–84*	*1990–93*	*1985–89*	*1980–84*
Not highest school	0.13	0.15	0.20	0.18	0.21	0.22
Highest school	0.18	0.32	0.42	0.29	0.29	0.31
VET	0.37	0.32	0.37	0.43	0.34	0.39
University	0.49	0.65	0.66	0.56	0.63	0.57

Source: Estimated from 1997 *SET* and 1993 *STE* data.

Summary: Education and training outcomes

VET graduates appear less likely to be studying at any point in time or to have recently undertaken a training course than university graduates in the data sets used in this paper. Consequently, a lower proportion of them is estimated to have completed a follow-up qualification within 15 years of completing their initial qualification (20% compared to 40%). Participation in education falls with the time since individuals completed their previous education, but completion of a training course rises, at least up to 15 to 20 years after individuals completed their formal education. About half of all VET graduates who are studying at any point in time study in a TAFE, with a similar proportion choosing to undertake their further studies in the same field as their earlier one.

Conclusion

Summary of the key findings

The principal conclusion of this report is that completion of VET qualifications improves the full-time employment outcomes of graduates compared to individuals who do not undertake post-school qualifications. Completion of a VET qualification provides a two-tiered benefit to individuals. It increases the likelihood that they will work full time. Then, among those working full time, it increases their wage, occupational status and permanent employment outcomes.

The full-time employment outcomes achieved by individuals who complete a VET qualification are significantly higher than relevant comparison groups immediately after the groups enter the labour market. The VET qualifications appear to smooth the transition to full-time employment for graduates. Over time, differences between the employment outcomes of VET graduates and the comparison groups narrow, as the outcomes of the comparison groups improve.

Male VET graduates appear to enjoy more substantial immediate benefits from completion of their qualifications than do female graduates, with differences in the impact of completion of a skilled vocational qualification lying at the heart of the divergence in outcomes. Further out from their courses, life-cycle factors push male and female full-time employment outcomes further apart. The presence of children in their household pushes female full-time employment down by more than males, while being married pushes male employment up more than female employment.

The actual fields in which VET graduates complete their qualifications also have an impact on their outcomes, with some fields providing outcomes almost 20 percentage points lower than those of the business field. These differences between fields exceed those between VET qualification levels.

Individuals from important equity groups, such as people with a disability, people who live in non-metropolitan regions of Australia, or people from non-English-speaking backgrounds, experience poorer full-time employment rates than other groups in Australia. However, there does not appear to be a VET-specific element to these outcomes—that is, their outcomes from VET participation appear no worse than other groups once their pre-existing levels of 'disadvantage' are taken into account. Older women may have poorer outcomes from VET than younger ones, though the opposite is true for male graduates. The small number of individuals who undertake their VET-level qualifications through 'Industry Skills, Skillshare or other government training centres' have significantly worse employment outcomes than other VET graduates from other providers.

Individuals who complete VET qualifications and work full time tend to enjoy higher wages, work in higher status occupations and have higher rates of permanent employment than members of their comparison groups. However, the profiles of these outcomes and the time since individuals completed their studies differ between the outcomes. The wages of VET graduates and the comparison groups converge, while the occupational outcomes diverge and the difference in the proportion of employees employed on a permanent basis remains constant.

VET graduates appear less likely to be studying at any point in time or to have recently undertaken a training course than university graduates in the data sets used in this paper. Consequently, a lower

proportion of them is estimated to have completed a follow-up qualification within 15 years of completing their initial qualification (20% compared to 40%). Participation in education falls with the time since individuals completed their previous education, but completion of a training course rises, at least up to 15 to 20 years after individuals completed their formal education. About half of all VET graduates who are studying at any point in time study in a TAFE, with a similar proportion choosing to undertake their further studies in the same field as their earlier one.

Policy implications

The main policy implication from the findings of this report is that completion of a VET qualification improves the longer-term labour market outcomes of its graduates. That is, as a sector, the VET sector has a positive impact on the post-course labour market experiences of its graduates. This is an important finding for potential students and is one element of the justification for maintaining public funding to the sector.

The education outcomes are less clear. Participation by VET graduates in further education and training does not appear to be substantially higher than the comparison groups. Government policies towards lifelong learning, in which individuals are largely responsible for their own skills upgrading and development, presuppose high levels of individual motivation, confidence and aptitude towards further learning. Discussion in the next subsection points to the need to distinguish the role of these factors from others in explaining further education and training participation by VET graduates. This would be informative about the likely success of policies that are reliant on individual decision-making and action.

The finding that the full-time employment outcomes of key equity groups other than women are not much different from other VET sector graduates, places prior research on the issue in some context. Previous findings—based on analysis of VET sector graduates only—that equity groups have worse employment outcomes, appear to reflect no more than that such groups have poorer outcomes across all education levels. This is not an argument for placing less emphasis on equity within the sector, given the disadvantaged nature of many of its students. Rather, it provides support for existing policies and some justification for identifying programs within institutions that promote better outcomes for equity groups and for communicating this information throughout the sector. Identification of the appropriate policies to respond to differences in the employment outcomes of males and females, requires an understanding of issues identified in the next subsection.

Unresolved issues

This report has provided evidence about some of the longer-term outcomes of completion of a VET qualification. In doing so, it has addressed an area that has received little attention to date, as noted in Dumbrell (2000). There remain other potential longer-term effects of VET that require analysis, and our understanding of some of those studied here may benefit from the insights provided by other methodological approaches and the analysis of different types of data.

One important finding of this report was that the unemployment rate at their time of entry to the labour market had a permanent negative effect on the full-time employment rates of male cohorts. This result was only evident once the different labour market entry cohorts were identified. Although it supports the findings of at least one other Australian study of labour market outcomes, further work on the issue is probably necessary to confirm it. If validated, the importance of governments pursuing policies and programs that facilitate labour market entry during economic downturns is clear.

Other results presented here point to further questions. For example, a key element of the difference in full-time employment outcomes between males and females was directly related to the 'value' provided by the VET qualification to males compared with females. An important question is whether this reflects differences in the learning experience provided by VET to males and females, structural characteristics of the labour market, or the existence and operation of formal

institutions that aid transitions to full-time employment.[24] That the difference in 'value' was most evident in relation to skilled vocational qualifications, dominated by trade qualifications, suggests that the apprenticeship institution is likely to be an important part of the explanation for this phenomenon. However, identifying the contribution of the other factors to this phenomenon would provide a better basis for improving female employment outcomes.

Similar questions surround the finding about the considerable differences in longer-term employment outcomes between fields of study. Once more, the question is whether they reflect differences in the learning experience provided in different fields within the VET sector, structural characteristics of the labour market, or the existence and operation of formal institutions that aid transitions to full-time employment. In this case, the strong employment outcomes achieved by graduates from business courses suggest that it is more than the existence or operation of transition institutions at work here. The magnitude of the differences between fields highlights the importance of further work to address these issues.

Finally, the evidence in the data used here suggests that participation by VET graduates in further education and training is lower than university graduates and possibly lower than Year 12 completers. This appears to be the case for both recent graduates (other than the most recent male university graduates in 1997) and those who completed their qualifications longer ago. Consequently, twice as many university graduates appear to complete follow-up qualifications than VET graduates. Firstly, this pattern needs to be reconciled with the destinations data from the TAFE and university sectors, which show higher participation in education by VET graduates in their first year after their earlier course than university graduates. Secondly, it is possible that the education outcome indicators used here have missed important dimensions of participation in further education and training by VET graduates. For example, the 'studying or not' indicator used here picks up individuals studying for educational 'certificates of less than one semester' in the 1997 data, as well as individuals who were studying but did not intend to complete their qualifications. However, it may have missed individuals who undertook course modules that do not lead to 'certificates'. An appreciation of the extent of any underestimate of participation in further education and training by VET graduates would obviously clarify the need for any policy response.

If the results of this report are validated by this further work, the reasons behind these different participation patterns in further education and training need to be identified. An understanding of whether these differences are driven by differences in the way 'learning skills' are developed between the sectors, in views on the importance of skills upgrading and lifelong learning between graduates of the sectors, or in the economic forces that shape the jobs of the sectors' graduates differentially, would help identify an appropriate response. The first two factors are obviously more amenable to influence by the VET sector itself. If they are important in explaining the difference in participation in further education and training between the sectors, action within the VET sector can help expand its own market by developing the skills and shaping the attitudes to learning of its present student base.

[24] Collins et al. (2000) review the literature on such issues in relation to the school-to-work transition.

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Appendix A: VET qualifications in the 1997 *SET*

Associate diploma	The entry requirement is usually the completion of Year 12 or the completion of Year 10 and a prerequisite certificate course. The duration of study ranges from 1–2 years full-time study or equivalent. Courses provide individuals with the knowledge and skills necessary to give support to professionals, and for positions in advanced trade, technical or associate professional occupations. Examples are an Associate Diploma in Business Administration, an Associate Diploma of Engineering in Civil Engineering, an Advanced Certificate in Panel Beating, a Certificate of Technology in Architectural Drafting and a Technician's Certificate in Foundry Practice.
Skilled vocational qualifications	The entry requirement is usually the completion of Year 10 or its equivalent. In addition, some courses may require a student to be concurrently employed in that specific field. The duration of study is 2–4 years, and typically involves some on-the-job training. Courses provide individuals with the knowledge and skills necessary to work in a specific vocation, recognised trade or craft, that requires a high degree of skill in a range of related activities. Examples are a Trade Certificate in Vehicle Building, a Certificate in Landscape Design and an Apprenticeship in Electrical Fitting.
Basic vocational qualifications	These often require Year 10 completion; however, many courses have no formal entry requirements. The duration of study ranges from one semester to one year of full-time study or equivalent. Courses provide individuals with the practical skills and background knowledge necessary for employment at the operative level in many different fields. Examples are a Pre-apprenticeship in Plumbing, a Certificate in Shorthand and Keyboarding, a Traineeship Certificate in Advertising, Pre-vocational Certificate in Automotive Mechanics and a Certificate of Applied Science in Textile Technology.

Source Extracts from the *Glossary* in ABS (1998)

Appendix B: *SET* population coverage

The 1993 *STE* and 1997 *SET* data exclude those individuals who were not in the labour force and who were not 'marginally attached' to it. The exclusion of some individuals not in the labour force means that the surveys are not representative of the entire population aged 15 to 64. Consequently, estimated employment to population ratios from the data are inaccurate, for example, since the information on the denominator is incomplete. It is possible to use data from other ABS sources to estimate how the data coverage affects the estimated employment rates.

The discontinued ABS *Labour force status and educational attainment* publication contained a breakdown of the total male and female populations by age according to the ABSCQ classification of qualifications in February 1994. It also contained separate estimates of employed persons with differing levels of education by full-time or part-time status, gender and by age group. Unfortunately, these employment estimates and similarly structured unemployment ones were not cross-classified. However, it is possible to estimate the cells using a technique known as 'iterative scaling' (see Purcell & Kish 1979) (and supplementing the data with full-time and part-time employment and unemployment by gender and age estimates from the *Labour force survey* for February 1994). These allow full-time employment to population ratio estimates by age, gender and educational attainment level at that time, as well as similarly cross-classified estimates of the numbers employed, unemployed and not in the labour force. Another ABS publication, *Persons not in the labour force*, splits those not in the labour force between those marginally attached and those not marginally attached by age and gender (as at September 1993). The proportion of those not in the labour force marginally attached for each age group was multiplied by the total not in the labour force for each education level in that age group, to provide an estimate of marginal attachment by qualification level, by age and gender. These figures were then added to the estimated labour force by age, gender and educational level to provide an estimate of the population surveyed in the *SET* and *STE* surveys.

The resulting estimated full-time employment to population ratios by age, gender and educational level for the population comparable to the *SET* data and the 'true' population are compared in table B1. It shows the *SET* estimate divided by the 'true' one, so it contains an estimate of the extent to which the full-time employment to population ratios in the *SET* data are 'overestimated'. A value of one in the table would suggest that the estimated ratio reflects the 'true' population estimate, while a value of 1.1 suggests that it overestimates it by 10%. As expected, the *SET* estimates are more reliable (closer to one) for males than females, more reliable for younger workers than older ones and for individuals with higher levels of education than those with less education.

It is also possible to use the full-time employment to population ratios to estimate the effect of education level on full-time employment outcomes in both the population comparable to the *SET* data and the 'true' population. These regression estimates provide some indication of the extent to which parameters based on the *SET* population will be biased estimates of the effect of education level on the proportion of the entire population working full time. The regression parameters estimated from the male rates for those aged 44 or less from the *SET* population were 69%, 84% and 90% of those estimated from the 'true' population for associate diploma, skilled vocational and basic vocational graduates, respectively. For females, the proportions were 71%, 77% and 73% respectively, confirming that generally the bias downwards was slightly higher in the parameters from

the female equation. However, the parameters estimated over the *SET* data are unbiased estimates of the effect of education level on that population. Therefore, the approach used in this paper to 'correct' for the unrepresentativeness of the *SET* data, is to use the parameters based on the *SET* data to estimate the probability that individuals in that population work full time and divide it by the relevant cell from table B1.

Table B1: Overestimate of the 'True' employment to population ratio in the *SET* data

Education	Age				
	15–24	25–34	35–44	45–54	55–69
			Males		
Higher degree & postgraduate diploma	1.00	1.04	1.04	1.03	1.24
Bachelor degree	1.09	1.02	1.05	1.05	1.41
Undergraduate diploma	1.08	1.02	1.09	1.07	1.50
Associate diploma	1.03	1.04	1.04	1.11	1.76
Skilled vocational qualification	1.03	1.02	1.03	1.08	1.76
Basic vocational qualification	1.08	1.05	1.05	1.06	1.49
Completed highest level of secondary	1.15	1.05	1.08	1.13	1.72
Did not complete highest level of school	1.10	1.06	1.06	1.15	2.13
Total	1.10	1.04	1.05	1.10	1.85
			Females		
Higher degree & postgraduate diploma	1.08	1.09	1.07	1.07	1.98
Bachelor degree	1.05	1.12	1.12	1.14	2.40
Undergraduate diploma	1.07	1.14	1.12	1.18	2.69
Associate diploma	1.03	1.14	1.12	1.21	3.04
Skilled vocational qualification	1.07	1.20	1.19	1.29	3.41
Basic vocational qualification	1.10	1.20	1.18	1.22	2.84
Completed highest level of secondary	1.19	1.22	1.23	1.33	3.35
Did not complete highest level of school	1.27	1.32	1.30	1.49	4.50
Total	1.17	1.22	1.22	1.34	3.80

Source: Author estimates based on data from ABS (1993, 1994b, 1994c)

Appendix C: Regression results

Table C1: Probit estimates of working full time—aggregate VET

	Males			Females		
	Coef.	b/st.er.	Marg. eff.	Coef.	b/st.er.	Marg. eff.
Constant	-1.401	-3.36		-5.973	-3.85	
Age	0.131	3.95	0.040	0.570	3.37	0.222
Age squared/100	-0.225	-4.13	-0.068	-1.646	-2.87	-0.642
Age cubed/100				0.016	2.48	0.006
Married	0.883	5.48	0.212	0.089	2.37	0.035
Children in household, youngest <5	-0.723	-5.94	-0.095	-1.502	-19.02	-0.586
Children in household, youngest 5–14	-0.686	-5.42	-0.074	-1.057	-14.71	-0.412
Born overseas, English-speaking country	0.002	0.04	0.001	-0.050	-0.74	-0.019
Born overseas, non-English-speaking country	-0.457	-2.29	-0.138	0.056	0.18	0.022
NESB, but interview in English	-0.149	-2.50	-0.045	-0.011	-0.18	-0.004
NESB, interview not in English	-0.217	-2.60	-0.065	0.084	1.03	0.033
Victoria	0.022	0.50	0.007	-0.028	-0.59	-0.008
Queensland	-0.038	-0.84	-0.011	-0.024	-0.46	-0.004
South Australia	-0.121	-2.36	-0.037	-0.183	-3.35	-0.074
Western Australia	0.034	0.66	0.010	-0.097	-1.95	-0.044
Tasmania, NT, ACT	-0.089	-1.84	-0.027	-0.006	-0.11	-0.001
Completed highest school level	-0.184	-2.15	-0.055	-0.344	-3.62	-0.134
VET qualification	0.666	5.13	0.201	0.268	2.08	0.105
University	0.236	1.83	0.071	0.193	1.48	0.075
Entry unemployment rate	-0.037	-2.48	-0.011	-0.014	-0.87	-0.005
Time since completed education	0.030	1.31	0.009	0.017	0.61	0.007
Squared time since completed education	-0.017	-1.72	-0.001	-0.023	-1.81	-0.009
Completed high school by time since completion	0.051	4.94	0.015	0.049	4.98	0.019
VET qualification by time since completion	-0.050	-1.66	-0.015	0.039	1.07	0.015
VET qualification by age by time since completion interaction	0.001	1.78	0.0004	-0.001	-1.32	-0.001
University by time since completion	0.046	3.19	0.014	0.019	1.58	0.007
Completed education 1990 to 1994	0.167	2.59	0.050	0.165	2.46	0.065
Completed education 1985 to 1989	0.039	0.45	0.012	0.135	1.49	0.053
Completed education 1980 to 1984	0.092	0.87	0.028	0.158	1.42	0.062
Completed education 1979 or earlier	0.137	1.08	0.041	0.184	1.35	0.072

	Males			Females		
	Coef.	b/st.er.	Marg. eff.	Coef.	b/st.er.	Marg. eff.
			Field			
Health	-0.618	-3.40	-0.186	-0.136	-1.32	-0.053
Education	-0.337	-0.70	-0.102	-0.438	-1.56	-0.171
Society and culture	-0.500	-2.99	-0.151	-0.522	-4.94	-0.204
Science	-0.442	-3.18	-0.133	0.176	1.23	0.069
Engineering	-0.035	-0.38	-0.011	-0.282	-1.87	-0.110
Architecture and building	-0.261	-2.58	-0.079	-0.252	-0.86	-0.098
Agriculture	0.047	0.32	0.014	-0.059	-0.26	-0.023
Miscellaneous fields	-0.355	-3.33	-0.107	-0.474	-5.35	-0.185
			Variance function			
Victoria				0.077	1.01	
Queensland				0.141	1.77	
South Australia				-0.054	-0.63	
Western Australia				-0.169	-2.13	
Tasmania, NT, ACT				0.027	0.34	
Married	0.230	2.05				
Children in household, youngest <5	-0.525	-4.71				
Children in household, youngest 5–14	-0.566	-4.06				
	Males			*Females*		
Number of observations	9004			8134		
Log likelihood function	-4306.5			-4626.9		
Restricted log likelihood	-4876.2			-5625.3		
Chi-squared	1139.4			1996.8		
Degrees of freedom	39			42		
Significance level	0			0		
McFadden's R-squared	0.117			0.171		
Model predictions	*Actual total*		*% correct predictions**	*Actual total*		*% correct predictions**
Not working full time	2088		0.31	4295		0.70
Working full time	6916		0.90	3837		0.72
Total	9004		0.76	8134		0.71

* With a cut-off probability of 0.6 for males, but 0.5 for females.

Table C2: Probit estimates of working full time—disaggregated VET qualifications

	Males			Females		
	Coef.	b/st.er.	Marg. eff.	Coef.	b/st.er.	Marg. eff.
Constant	-1.511	-3.84		-6.318	-4.34	
Age	0.141	4.60		0.616	3.89	0.242
Age squared/100	-0.240	-4.84		-1.801	-3.32	-0.707
Age cubed/100				0.017	2.89	0.007
Married	0.810	5.41	0.205	0.094	2.52	0.037
Children in household, youngest <5	-0.648	-5.23	-0.089	-1.492	-18.81	-0.586
Children in household, youngest 5–14	-0.710	-6.41	-0.062	-1.040	-14.54	-0.408
Born overseas, English-speaking country	-0.001	-0.01	0.000	-0.043	-0.64	-0.017
Born overseas, non-English-speaking country	-0.442	-2.23	-0.136	0.066	0.22	0.026
NESB, but interview in English	-0.140	-2.40	-0.043	-0.009	-0.15	-0.004
NESB, interview not in English	-0.198	-2.41	-0.061	0.093	1.16	0.037
Victoria	0.012	0.28	0.004	-0.046	-0.95	-0.015
Queensland	-0.028	-0.62	-0.009	-0.036	-0.71	-0.009
South Australia	-0.112	-2.21	-0.035	-0.185	-3.42	-0.075
Western Australia	0.035	0.70	0.011	-0.093	-1.90	-0.044
Tasmania, NT, ACT	-0.085	-1.79	-0.026	-0.012	-0.23	-0.004
Completed highest school level	-0.217	-2.69	-0.067	-0.388	-4.62	-0.153
Basic vocational	0.093	0.80	0.029	-0.049	-0.57	-0.019
Skilled vocational	0.746	6.81	0.230	-0.189	-1.80	-0.074
Associate diploma	0.326	2.08	0.101	0.130	1.27	0.051
University	0.163	1.42	0.050	0.127	1.21	0.050
Entry unemployment rate	-0.032	-2.17	-0.010	-0.014	-0.93	-0.006
Time since completed education	0.034	1.51	0.010	0.006	0.25	0.002
Squared time since completed education	-0.020	-1.74	-0.001	-0.020	-1.67	-0.008
Completed high school by time since completion	0.054	5.52	0.017	0.053	5.64	0.021
Basic vocational by time since completion	-0.044	-2.57	-0.014			
Skilled vocational by time since completion	-0.093	-5.82	-0.029			
Associate diploma by time since completion	-0.046	-2.30	-0.014			
VET qualification by time since completion				0.081	2.52	0.032
VET qualification by age by time since completion interaction	0.002	5.29	0.001	-0.002	-2.30	-0.001
University by time since completion	0.055	4.08	0.017	0.024	2.23	0.009
Completed education 1990 to 1994	0.097	1.50	0.030	0.154	2.33	0.061
Completed education 1985 to 1989	-0.066	-0.76	-0.020	0.120	1.35	0.047
Completed education 1980 to 1984	-0.038	-0.36	-0.012	0.150	1.37	0.059
Completed education 1979 or earlier	0.000	0.00	0.000	0.179	1.32	0.070

	Males			Females		
	Coef.	b/st.er.	Marg. eff.	Coef.	b/st.er.	Marg. eff.
Variance function						
Victoria				0.078	1.01	
Queensland				0.131	1.63	
South Australia				-0.070	-0.82	
Western Australia				-0.195	-2.46	
Tasmania, NT, ACT				0.030	0.37	
Married	0.188	1.73				
Children in household, youngest <5	-0.472	-4.14				
Children in household, youngest 5–14	-0.668	-4.97				
	Males			*Females*		
Number of observations	9004			8134		
Log likelihood function	-4306.9			-4692.8		
Restricted log likelihood	-4876.2			-5660.2		
Chi-squared	1138.5			1934.9		
Degrees of freedom	35			36		
Significance level	0			0		
McFadden's R-squared	0.117			0.173		
Model predictions	*Actual total*		*% correct predictions**	*Actual total*		*% correct predictions**
Not working full time	2088		0.31	4295		0.70
Working full time	6916		0.89	3839		0.73
Total	9004		0.76	8134		0.71

* With a cut-off probability of 0.6 for males, but 0.5 for females

Appendix D: Variable definitions

Table D1: Variable descriptions and mean values

Variable	Description (a)	Mean values	
		Male	Female
Working full time	Individuals worked 35 or more hours in all jobs	0.768	0.472
Working part time	Individuals worked less than 35 hours in all jobs	0.094	0.306
Occupation	ANU 3 scale scores assigned to individuals ASCO major group classification in their current job	32.500	36.700
Wages	Weekly wages in current job were estimated as the mid-point of the wage interval that individuals reported. The top category were assigned 1.33 times the cut-off value of $1160. Considerably more males were in this category than females.	494	479
Casual	Casual employee in current job	0.104	0.085
Studying	Persons who enrolled to study for an educational qualification in the survey year	0.184	0.185
Studying at a TAFE	Persons who enrolled to study for an educational qualification at a TAFE in the survey year	0.086	0.059
Completed further qualification	Individuals who had completed two or more post-school qualifications	0.102	0.102
Study in same field	Individuals whose second qualification (completed or in progress) was in the same broad field of study as their initial one	0.130	0.132
Training course in past 12 months	Individuals who undertook a training course in the 12 months prior to the survey	0.391	0.409
Vic	Victoria	0.203	0.204
Qld	Queensland	0.184	0.184
SA	South Australia	0.118	0.117
WA	Western Australia	0.133	0.127
Tas, NT, ACT	Tasmania, Northern Territory or Australian Capital Territory	0.146	0.143
Married	Married	0.487	0.513
Child <5	Child aged less than 5 years present in household	0.245	0.268
Child 5-14	Child aged 5 to 14 years present in household	0.087	0.127
Born overseas, English-speaking country	Born overseas, English-speaking country	0.061	0.061
Born overseas, non-English-speaking country	Born overseas, non-English-speaking country	0.053	0.052
NESB, but interview in English	Non-English speaking background but the survey interview was conducted in English	0.069	0.076
NESB, interview not in English	NESB, interviewed with difficulty in English or in another language	0.005	0.002

Variable	Description (a)	Mean values	
		Male	Female
Age	Age, based on single year of age up 24 years, then the mid-point of five year intervals thereafter to the 40 to 44 years category	27.900	27.300
Completed school	Completed highest level of school	0.190	0.219
Basic vocational	Basic vocational	0.093	0.172
Skilled vocational	Skilled vocational	0.248	0.053
Associate diploma	Associate diploma	0.048	0.048
University	Undergraduate diploma, bachelors degree, postgraduate diploma or higher degree	0.160	0.229
Completed education 1990 to 1994	Indicator variable equal to 1 if individual completed their education in the relevant time period; zero otherwise	0.273	0.278
Completed education 1985 to 1989	Indicator variable equal to 1 if individual completed their education in the relevant time period; zero otherwise	0.277	0.276
Completed education 1980 to 1984	Indicator variable equal to 1 if individual completed their education in the relevant time period; zero otherwise	0.272	0.248
Completed education 1979 or earlier	Indicator variable equal to 1 if individual completed their education in the relevant time period; zero otherwise	0.101	0.110
Entry unemployment rate	Male adult unemployment rate in the year the individual completed their schooling or first post-school qualification	7.900	7.900
Time since completed education	Years since individual completed either their schooling or their first post-school qualification	8.400	8.200
Field	*Field of VET study*		
Business	Business	0.037	0.127
Health	Health	0.007	0.028
Education	Education	0.001	0.003
Society and culture	Society and culture	0.009	0.028
Science	Science	0.014	0.012
Engineering	Engineering	0.179	0.011
Architecture and building	Architecture and building	0.066	0.003
Agriculture	Agriculture	0.017	0.005
Miscellaneous fields	Miscellaneous fields	0.047	0.044
VET provider types			
TAFE/technical college	TAFE/technical college	0.322	0.168
Business college or adult/ community education centre	Business college or adult/community education centre	0.005	0.048
Industry Skills, Skillshare or other government training centre	Industry Skills, Skillshare or other government training centre	0.012	0.012
Professional/industry association	Professional/industry association	0.022	0.020
Other private training organisation	Other private training organisation	0.017	0.036

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